

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI, GHANA.**

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**FACTORS INHIBITING THE IMPLEMENTATION OF OCCUPATIONAL
HEALTH AND SAFETY IN THE GHANAIAN CONSTRUCTION INDUSTRY**

BY

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MASTER OF SCIENCE IN CONSTRUCTION MANAGEMENT

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**DECLARATION AND
CERTIFICATION**

I hereby declare that this submission is my own work towards the MSc. Construction Management and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except the literature review where due acknowledgment has been made in the text.

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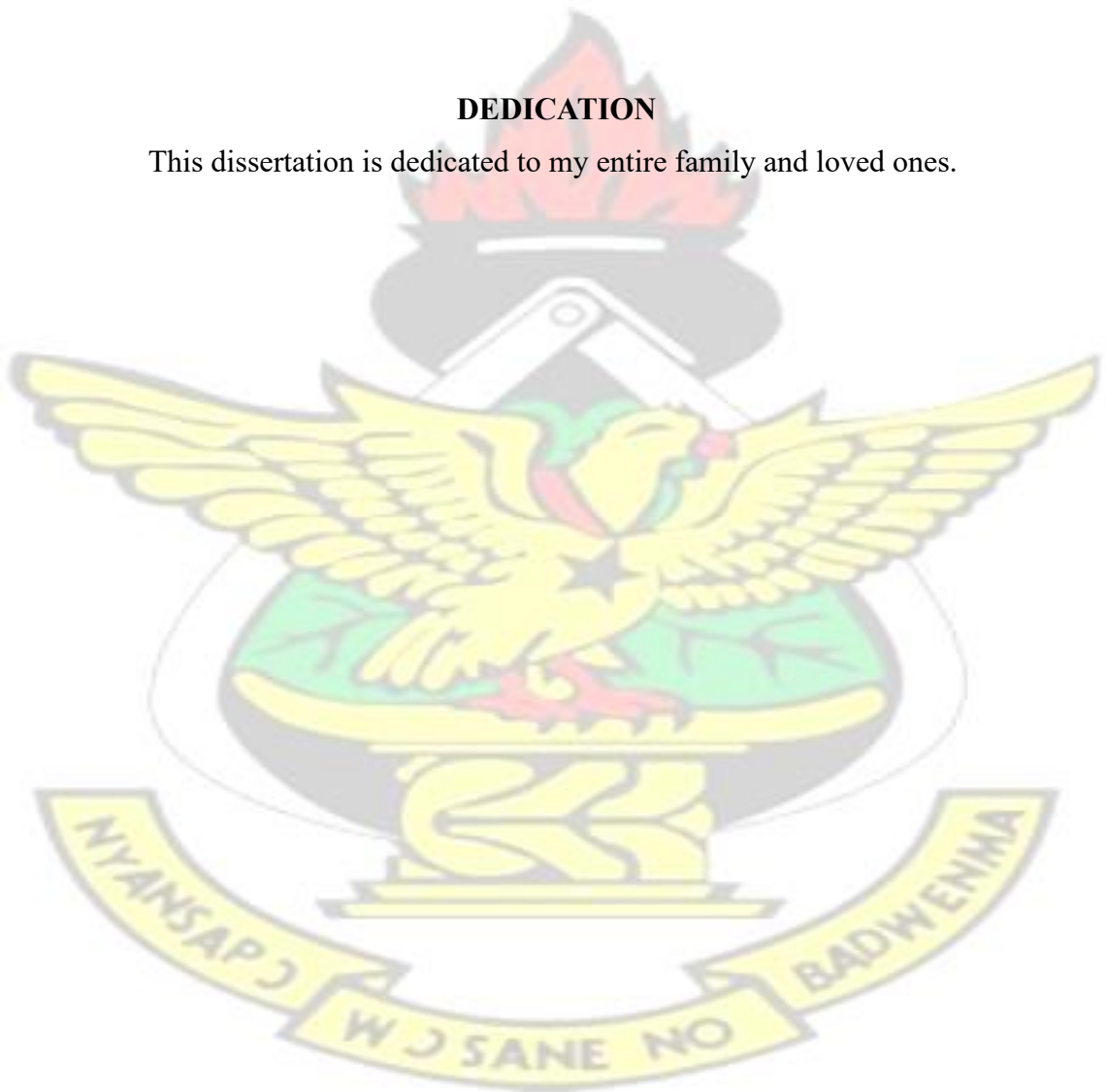
ABSTRACT

Health and safety continues to be a priority issue for those working and managing the construction industry across the world due to the critical and aggravating menace of occupational hazards and accidents plaguing the industry. This research seeks to make contributions to the body of knowledge by identifying critical factors militating against occupational health and safety (OHS) in the Ghanaian Construction Industry. The study was limited to some selected (32) construction firms in Kumasi. A sample of 100 respondents was selected using non-probability sampling method. The findings of the study were analyzed and presented using both descriptive and inferential statistical methods. Inferential statistical method was mainly used to extract the critical factors, which were compared with the findings from descriptive statistical method. Conclusions and recommendations were made towards the accomplishment of the research objectives. This study revealed that, the critical factors inhibiting the implementation of occupational health and safety includes: disorganized and transient workforce, Temporary nature of construction projects, fixed cost of project, unavailability and insufficient OHS policy, little priority given to OHS and poor commitment of managers and workers to OHS. The study concluded that poor health and safety performance of the Ghanaian Construction Industry is due to behavioral issues of negligence and/ or carelessness on the part of construction managers and workers. It is recommended that construction managers should create an awareness on OHS; Make provision for regular health services; Ensure adherence to regulations and standards of OHS; Make provision for personal protective equipment and enforce the utilization of them and undertake a risk assessment on health and safety periodically. These measures will go a long way to promote Occupational health and safety in the Ghanaian construction industry.

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DEDICATION

This dissertation is dedicated to my entire family and loved ones.



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First and foremost, I want to acknowledge the Source of Everything, the almighty God, by whose strength I have been able to achieve this feat. The reality and success of this research work was born out of the invaluable assistance and contribution of some personalities to whom I am thankfully indebted and thus will be an act of gross selfishness if I do them this dishonor.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

The Ghanaian Construction Industry has recently experienced considerable growth in activities and this can be attributed to the rapid growth in population and urbanization. This is evidently seen as construction activities grew by 8.5% in 2010, 8.9% in 2011, 10.55% in 2012 and 12.6% in 2013 (Gross Domestic Product, Ghana Statistical Service, 2013). Construction industry contributes to the development of the nation's social and economic sectors (George, 2012). The industry is therefore seen as one of the drivers of economic growth, as it provides employment to local people and effectively utilizes the natural resources (Anaman and Osei- Amponsah, 2007).

The Construction industry however has been recognized internationally as one of the most dangerous industries after the mining sector (International Labour Organization, 2008). Construction works are associated with high health and safety risks. Construction works involve working at height, underground, in spaces that are confined and at a proximity close to falling objects or materials (Akintoye and Macleod, 1997). Consequently, construction workers are often subjected to fatalities and ill- health problems. These risks can also be attributed to the nature of the work; materials, plant and heavy duty equipment used; condition of the physical environment; method employed in executing the works; unsafe exposure to dust, fire, live cables, noise, hazardous substances and the properties of the project itself (Langford et al., 2000).

Generally, accidents have very damning consequences for the construction industry. Gillen (2002), stated that the company concerned may have to face legal charges for

manslaughter in worst cases. Management of construction industry should therefore ensure better strategies and adopt measures that are appropriate in preventing accidents and fatalities (Nongiba, 2008).

Safety measures should include safe working environment and the use of Personal Protective Equipment (PPE). Michael (2002), stated that an organization's culture and policies should be made visible to all employees and management. Tuula (1999), stated that occupational training is regarded as important in maintaining safety and work ability of Construction workers.

1.1 DEFINITION OF THE CONCEPT OF HEALTH AND SAFETY

Lingard and Rowlinson (2005), stated that the concept of health and safety is cross-disciplinary which concerns itself with the welfare of the people by ensuring that workers are protected as they undertake the construction works. Dadzie (2013), stated that managements of the construction industry are responsible for the well-being of their workers both physically and psychologically. They also owe a duty to other third parties like visitors, passers-by, who are likely to be affected adversely by the construction works (Kheni, 2008). The culture of every organization should incorporate in it an aspect or element of health and safety, this will ensure that the values and attitudes of the managers and workers are geared towards improved health and safety performance in the construction industry (Michael, 2002).

1.2 STATEMENT OF THE PROBLEM

Accidents in the construction industry are increasing at an alarming rate. These accidents are associated with risks of severe injuries, deformation of body which may be permanent and even death (Quartey and Bill, 2012). The consequence of such occurrence impact the nation's economy as it lowers the population of the workforce, diminishes productivity and affect negatively the overall work performance (International Labour Organization, 2008).

Adei and Kunfaa (2007) revealed that the most common occupational diseases associated with Construction industry are musculoskeletal (lower back) pain; respiratory tract infections; asthma; conjunctivitis and hearing problems. These health problems can be related to long working hours, lifting of heavy machinery, dusty and noisy nature of construction work.

Despite the vulnerability of construction workers to these risks, the proposal for effective adaptation and implementation of health and safety regulations at construction site has not been embraced as expected by developers and builders. Laryea (2010), conducted a study and it was revealed that almost 90% of the construction sites visited did not implement the policies of occupational health during the execution of their works. The Ghanaian Construction industry still remains at the mercy of increased health and safety hazards during the execution of her development projects.

It has become necessary to conduct an empirical investigation to identify the factors inhibiting the implementation of occupational health and safety.

1.3 RESEARCH QUESTIONS

The research seeks to address the following questions;

- I. What is the current level of awareness of construction stakeholders on the concept of health and safety?
- II. What constitutes the general barriers associated with the implementation of health and safety practices in the Ghanaian construction industry?
- III. What are the measures needed for the accomplishment of improved health and safety practices in the Ghanaian Construction Industry?

1.4 AIM

The aim of the study is to identify factors affecting occupational health and safety in the Ghanaian Construction Industry.

1.5 OBJECTIVES

- To determine the level of awareness of construction stakeholders on health and safety.
- To identify general barriers associated with the implementation of health and safety practices in the Ghanaian construction industry.
- To identify measures for achieving improved health and safety practices in the Ghanaian construction industry.

1.6 SIGNIFICANCE OF THE STUDY

Construction workforce sustains the economic and resource base of the construction industry. The health and safety of construction workers are therefore crucial to utmost work productivity and must be emphasized also for the realization of socio-economic and sustainable development of the world at large.

The International Labour Organization, World Health Organization and prospective clients require that there should be the incorporation of occupational health and safety practices in all construction organizations. However, most construction companies have failed to comply with the health and safety requirements (World Health Organization, 1995).

Health and safety provides an excellent and important area for exploring behavioural issues of construction industry and one in which an original contribution to research as well as practice can be made. This research seeks to identify organisational behaviour that would comply with the law/ standards and embed behaviours to improve the health and safety of construction workers.

A positivist approach delivered through a survey shed contextual insights into the intricacies and dynamics of health and safety at construction sites. This research work has potential of achieving something impactful for the accomplishment of safer working practices and improved health and wellbeing of employees. There is therefore novelty and significance of this research work.

1.7 RESEARCH METHODOLOGY

In achieving the stated objectives, the study employed the following;

1.7.1 Literature review

Secondary data in the form of review of related literature from sources like existing books, earlier related research, pamphlets, journals, newspapers, the internet and other relevant publications were used to obtain information on the subject area from which questionnaires were prepared and administered.

1.7.2 Field Survey

The primary data were collected from field work or survey using observation and structured questionnaires, categorized under quantitative research. Construction Professionals which includes Architects, Engineers, Quantity Surveyors and Contractors and various categories of workers such as masons, carpenters were contacted in Kumasi precisely for the required information. A non- probability method of sampling were used, adopting purposive sampling approach.

1.7.3 Data Analysis

The data obtained from the answered questionnaires were organized, coded and imperiled to analysis by means of Statistical Package for Social Scientists, version 19 (SPSS Version 19). Both inferential and descriptive statistical methods were employed in the analysis of the research data obtained.

1.8 DELIMITATION OF STUDY

The study was limited to the building sector of the construction industry specifically to large and medium scale building Construction organizations.

1.9 ORGANIZATION OF THE RESEARCH WORK

The research was organized in five chapters. The first chapter is the general introduction which covers the background of research; problem statement; research aim; objectives; the study delimitation; a brief description of the methodology to be employed and justification of the study. The second chapter brings together all related literature in a comprehensive manner. The third chapter details the methodology and the fourth chapter provides a comprehensive analysis of the data received and discussion of the findings. The last but not least chapter provides the conclusion and recommendations.

1.10 IMPACT

The outcome of this study is expected to inform key stakeholders and decision makers of the factors militating against the implementation of occupational health and safety in the Ghanaian construction industry. The study reveals both major barriers affecting occupational health and safety and also recommends promotional measures to deal with these barriers. The study is also expected to form the basis for further studies in this area.

1.11 LIMITATION OF STUDY

Notwithstanding how far the extant research has reached, there were limitations associated with the study and some of these include;

- Time constraints considering the complexity of the semester concerned.
- Difficulty in accessing the respondents
- Respondents' inability to respond directly to the required questions
- Respondents' unwillingness to participate in the research study • Financial constraints.

However, provisions such as financial support and means to reach respondents were put in place in order to have a successful data collection. Due to the researcher's knowledge background, skills as well being abreast with ethical principles, the researcher was able to respond to individual respondent's needs.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter primarily examines in detail existing literature and research works on factors inhibiting the implementation of occupational health and safety in the Ghanaian construction industry. Critical review of pertinent literature was undertaken to assist in the identification of the existing work done that are relevant to the study, current findings, contributions made, limitations, criticisms, and study applications. The literature review will culminate into the development of comprehensive and critical questionnaire, which is revolved around the aim and objectives of the study.

2.1 THE NEED FOR OCCUPATIONAL HEALTH AND SAFETY PRACTICES IN THE CONSTRUCTION INDUSTRY

Construction is one of the major industries all over the world, employing over eight million persons, which represent about 7% of the total labour workforce (Sorensen et al., 2007). However, Construction works are much more hazardous than any other sector. It is known that construction projects are associated with a lot of work-related accidents and injuries (Aksorn and Hadikusumo, 2008). Major accidents associated with construction work include; falling of persons from heights especially during work on roofs, ladders and scaffolds; falling of materials and collapse of structures on workers.

These amount to severe injuries and fatalities at the construction workplace (Helander, 1991).

Each year over 200 people are killed in accidents at work site and about one million people are injured. Also, over two million people suffer illnesses instigated by their work. The incidence of lost and injuries involved with construction work activity is 200,000 hours of exposure of the construction worker (Hinze and Raymond 2003). Myers (2007), stated further that about 2% of accidents that occur cannot be prevented due to the unpredictable nature of such occurrence. It must be noted however that accidents by themselves do not just happen, but are often caused by certain acts and conditions at the worksite that are virtually unsafe and must be prevented.

It is estimated globally that, over 2.2 million people die each year from occupational work injury and illness. About 350,000 of these deaths are due to either fatal occupational accidents or work related diseases (International Labour Organization, 2005). The prevention of accidents resulting from work must be a major priority of everyone at the workplace. As can be evidently seen, the costs associated with the occurrence of injuries and the financial loss associated with disruptions in schedules and amount of compensation to be given to injured workers affect the profits that can be accrued from any construction project (Abudayyeh et al., 2006).

Lin and Mills (2001), stated that it is mandatory for all construction companies to provide an adequately safe working environment for their employees and subcontractors. Safety involves the provision of good working conditions and measures that thwart injuries at the workplace. Accident often leads to damage of property and severe injuries that are undesirable and somewhat unexpected consequences (Myers, 2007).

Lee et al. (2010), postulated that it is important for construction managers to consider the lifecycle of a construction project and its effect on the health of employees and occupiers. It was added in their study that certain guidelines should be developed to mitigate the effects of buildings on the health of humans and the environment. Sorensen et al. (2007), confirmed that programs conducted as a means of promoting health and safety at construction work site have addressed increasingly major risks that may be associated with construction workers.

2.2 CONSTRUCTION HEALTH AND SAFETY REGULATIONS

Construction work includes developing commercial, residential and industrial properties, these activities necessitate work compliance with health and safety regulations, which takes into consideration the safety of construction workers and the public in general. Common law confer a duty on every employer to provide a safe working environment, safe method of working, proper equipment and machinery for their employees. Employers are liable when accident occur and has lead to injuries or fatality of employee during the course of workers' employment (Osei- Asibey, 2011).

The Health and safety regulations that are operative in Ghana can be found under the following: Factories, Offices and Shops Act 1970, Act 328; Workmen's Compensation Law, Act 1987 (PNDC 187); National Labour Act 2003, Act 651; Code of Practice on Health and Safety in Construction Sites (ILO 1992); Building Regulations and Mining Regulations 1970, LI 665 (Fenson, 2007).

Cole (2002), detected that majority of the rules and guidelines relating to health and safety have been stipulated by the statutory regulations. The major concern of these Acts and Regulations is to ensure that organizations protect their employees in order to fulfil the requirements laid down by the health and safety regulations conscientiously. He added however that the standards set by these legal regulations are minimum.

2.2.1 Section 118 of National Labour Act 651 - General Health and Safety Conditions

The National Labour Act 651, (Act 2003) conveys on the employer to provide a safe, healthy and satisfactory working conditions for workers. It stipulates that, it is the duty of the employer to maintain a safe workplace and ensure an effective working plant. The Act instigate that the employer must provide adequate appliances, protective clothing and devices for workers personal use during the course of their employment, which should not amount to an extra cost to the employees. It is the duty of the employer to make available the needed instructions, supervision and training for the employees.

In addition, the employer must make available good facilities of welfare, accommodation, toilets, cleaning, washing and storage for workers on the jobsite. The employer should also provide good supply and potable drinking water at the construction site. The workers' literacy level, age and other factors must be taken into consideration when formulating work policies. The Act also provides right to workers to dissociate themselves from work that poses a dangerous threat to their safety and health. The employer in effect has no right to terminate the contract with such worker or withhold the worker's remuneration with the reason that the worker left the job (Act, 2003).

2.2.2 Factories, Offices and Shop Act 328, Act 1970

The factories, Offices and shop Act 328 enlist issues relating to health, safety and welfare of the construction industry. Such clauses are under listed below:

2.2.2.1 Rule one - Compliance

The rule states that every employer should comply with the health, safety and welfare requirements during the construction operations at the workplace (Ghana Legal, 2015).

2.2.2.2 Rule two - Provision for Welfare Facilities

This Act instigate that employers must provide appropriate welfare facilities including accommodation and canteen facilities. Canteen facilities must be equipped with tables and chairs for taking meals (Ghana Legal, 2015).

2.2.2.3 Rule three - Provision for First-Aid

The rule posited that employers are to make provision for first-aid facilities at the jobsite. Such facilities should be operational during the course of work and must be appropriately constructed with good equipment to provide effective medical care and treatment to injured workers in the event of accidents. Employers are liable to insure their work and the employees against injuries and fatalities (Ghana Legal, 2015).

2.2.3 Workmen's Compensation Law, Act 1987 (PNDC 187)

The PNDC 187 enshrine in detail means of compensating workers who are injured and affected due to the occurrence of accidents at the jobsite. This enhances employee jobsite safety and promote healthy working environment (Ghana Legal, 2015).

2.2.4 Code of Practice on Health and Safety in Construction Sites (ILO, 1992)

The International Labour Organization (ILO's) 1992, provides a Code of Practice on Health and Safety which is relative to the Construction site. The Code of Practice stipulates guidelines and measures for the application of Health and Safety practices at the construction industry. These include the provision of personal protective equipment and clothing, satisfactory welfare facilities, safe environment for working (ILO, 1992).

2.2.4.1 Protective Equipment and Clothing and their uses.

Employers are required to provide all workers with personal protective equipment and clothing on the construction site during work operations (ILO, 1992).

These include;

- Hard hats or safety helmets to shield the head from flying or falling objects and materials, or hitting the head against structures;
- Coloured and clear goggles, face shield, screen to protect the eye and face from harmful substances during operations such as welding, cutting flame, drilling rock, mixing concrete and others.

- Protective clothing such as gauntlets, gloves, barrier creams, head coverings, overalls, aprons and tight-fitting boiler suits to protect the hands the whole body against harmful substances, heat radiation and deformation of the skin.
- Hard impermeable footwear to protect the feet from sharp nails or tools beneath.
- Respirators and breathing gadgets to shield workers against hazardous substances such as dust, gases, fumes or oxygen deficiencies;

(ILO, 1999).

2.3 HEALTH AND SAFETY PRACTICES IN THE CONSTRUCTION INDUSTRY

Fenson (2007), postulated that critical areas of construction work that must be considered for effective health and safety management include: excavation and demolition works, shoring, working on scaffolds and ladders.

2.3.1 Excavation Work

Excavation work involves menacing operations that lead to people being injured or exterminated during the course of work. It involves activities such as laying of services, sewage, drainage and pipework. Accidents associated with excavation works include bodily contact with underground services and collapse of wall on people (Dien, 2000).

2.3.1.1 Health and Safety Precautions in Excavation

Fenson (2007), stipulated that the following practices should be ensured when undertaking excavation works as provided by General Provisions Regulation 1961.

- a) Fix a good quality of timber or other equally good material to excavation sides
- b) Proper method of excavation should be employed

- c) Regular inspection and supervision of excavation work should be done
- d) Excavation work should be executed by workers with appropriate skills.
- e) All braces and struts must be well secured and strong to hold sides firmly.
- f) Secure a safe exit for workers to use in the event of disaster during excavation.
- g) Examine near-by structures regularly to detect for collapsing structures.
- h) Provide fencing where work is exposed to the public or suited near roadway.

2.3.2 Demolition Work

Sayed (2008), theorized that the following practices should be incorporated before the execution of a demolition work, as they are essential to promote health and safety at the construction site. These are as follows: Review the work; Stabilize the adjacent buildings; Disconnect or Modify Services; Secure site to avoid unapproved access; Consult Specialists at an earlier stage; Re-coup important materials; Maintain few operatives on site always; Supervision should be done constantly; Adopt practical and safe methods that prevent collapse of structures SAFETY should be the main focus at all times.

2.3.3 Scaffolding

Abdelhamid and John (2000), posited that scaffolding is a temporary structure that provides a platform for construction works at a certain height about 2.0m from ground level. The factors below must be considered when scaffolds are to be used as suggested by the Health, Safety and Welfare regulation (1996).

- a) Erect and dismantle scaffoldings carefully
- b) Maintenance and repairs of scaffolds should be done by experts.

- c) The design and construction of scaffolds must consider the loads to be carried.
- d) The structure of the scaffold must be strong enough with rails and boards fitted appropriately to prevent people and materials from falling of it.
- e) The scaffold must lie on a strong and uniform surface.
- f) The uprights of a timber scaffold should have sole boards and base plate.
- g) The access and outlet of the scaffold must be safe.
- h) The Working platforms should be boarded fully to prevent workers from tripping or tipping.
- i) Barriers or fences should be provided around scaffolds erected near roadways.
- j) Secure and brace scaffold properly to the work structure.
- k) Avoid overloading of the scaffolds during construction work.
- l) Regular inspections and periodic maintenance of the scaffold should be done (Abdelhamid and John, 2000).

Deany and Yorke (2005), revealed that the following practices should be encouraged to ensure safety at the construction site:

- a) Employ Safety and health professionals for full-time at the construction site.
- b) Make available at all times the policies of health and safety
- c) Educate construction workers about dangerous practices
- d) Taking of alcohol and drugs should be prohibited at the construction site.
- e) Provide a report sheet for accidents that occur
- f) First aid services should be provided at all times at the worksite.
- g) Rescue units should be placed at near-by position

- h) Provide arrangements for securities such as fencing, poster signs and lighting.
- i) Make provision for fire protection equipment such as fire extinguishers, warning signs, safe exit for use in the event of a fire outbreak.

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2.4 BENEFITS OF OCCUPATIONAL HEALTH AND SAFETY COMPLIANCE

Hinze and Raymond (2003), instigated that the occurrence of injuries is a major concern since the incidence of such loss is a negative parameter. Helander (1991), posited that the cost associated with construction worksite accidents constitutes over 6% of construction costs. These costs should therefore provide some monetary incentives to construction managers to implement construction safety policies and also encourage contractors to invest in health and safety practices.

Cascio (2001), observed that effective management of health and safety will ensure the mitigation of cost associated with the occurrence of accidents. Such costs include;

- (a) Overtime cost
- (b) Cost of repairing or replacing damaged equipment
- (c) Cost of recruiting new workers to fill the position of injured workers
- (d) Cost of time lost in dealing with issues of accidents.
- (e) Cost involved in compensating injured workers.
- (f) Cost of medication that are unexpected and unbudgeted for by the company

Rudin (2005), identified the benefits of incorporating health and safety measures in construction organizations as follows:

- Likely reduction in the occurrence of injuries, illness, or death at the jobsite;

- Promote sound and cordial working environment;
- Increase the morale and work quality of employees;
- Enhance effective communication at the construction site.

2.5 FACTORS AFFECTING THE IMPLEMENTATION OF HEALTH AND SAFETY CONCEPT IN THE GHANAIAN CONSTRUCTION INDUSTRY.

The Construction industry executes works that are associated with major risks and which poses danger to construction workers. Safety system management has been implemented for several years, but its significance has been very low (Teo and Ling, 2006). Jaselskis et al. (1996), instigated that factors that determine an organization's safety outcome includes the money invested in safety programs, the frequency of safety inspections and time allocated to issues of safety at project sites and company levels. Factors affecting safety performance on construction sites include; economic factors, technical factors, psychological factors, procedural factors, organizational factors, historical factors and environmental issues (Sawacha et al., 1999).

Economic factors are determined by monetary values that are involved with the practice of health and safety and include hazard compensation fee that must be paid to construction workers who are affected by accidents. The technical factors and procedural factors can be assessed by the provision of training for construction site workers and the application of effective handling of equipment and plant on construction site. Psychological factors are determined by the safe and unsafe working behaviour of construction workers and supervisors. Historical factors are evaluated by the workers background and the individual characteristics, such as working experience and age. Environmental factors and

organizational factors can also be evaluated by the policy type adopted by management in dealing with safety at jobsite (Sawacha et al., 1999).

Aksorn and Hadikusumo (2008), identified four major factors influencing safety as follows; control and prevention safety system, worker involvement, commitment of management and safety arrangement. Dedobbeleer and François (1991) also identified the commitment of management to work site safety and the involvement of construction workers in safety practices as the two major factors that determine the level of incorporation of health and safety practices. Lin and Mills (2001), underlisted the size of the company, commitment of management and workers to health and safety practices as major factors that influence health and safety performance in construction companies.

Abdelhamid and John (2000), proposed that the major factors affecting unsafe working conditions are: actions and inactions of Management; unsafe behaviour of workers; events beyond the control of man; unsafe working site conditions. Gillen et al. (2002), identified deadlines to production and demands from client as factors affecting construction health and safety. Suraji et al. (2001), posited that the major factors that influence construction safety include; management of construction projects, work systems, work environment, operation factors and construction method.

Gambatese et al. (2005), stipulated that the construction project design is one of the significant factors that contributes to accidents at the construction site. Certain factors were perceived to limit the implementation of safety concepts in design, these include; the cost of the project and project schedule. These factors were further broken down into

incongruous planning of construction, inappropriate control of construction projects, incorrect operation of contracts, poor condition of site and inappropriate execution of works.

2.5.1 THE NATURE OF CONSTRUCTION WORK AS A FACTOR INHIBITING THE IMPLEMENTATION OF HEALTH AND SAFETY PRACTICES

The temporary nature of the construction project poses a major challenge to the various interventions aimed for the promotion of health and safety at the construction work site. Also the workers are often employed to undertake jobs for only a short period and hence do not stay at one job for a long time but transition from one job to another (Sorensen et al., 2007). It was also confirmed in the study of O'Connor et al. (2005) that construction workers are likely to receive inadequate safety training because of the temporary nature of the construction work.

Bust et al. (2008), postulated that migrant construction workers effect the performance of health and safety in the construction industry negatively. He added that the change of jobs, over a comparatively diminutive time period, put excessive burden on the administrators of health and safety. This is evident where performance is thwarted especially at a period when the construction industry is progressing successfully in addressing issues relating to the health and safety of construction employees.

Lin and Mills (2001), also added that the size of a construction industry is a major determinant of the safety performance and the extent to which health and safety practices can be implemented in the organization. Houtman and Bossche van den (2005), stated that extreme noise exposure at the workplace is one of the major factors that lead to increased

likelihood of workplace accidents. It was further stated that some of the health problems associated with workplace noise include stress, cardiovascular problems, straining of voice and loss of hearing.

2.5.2 PERCEPTIONS OF CONSTRUCTION STAKEHOLDERS ON OCCUPATIONAL HEALTH AND SAFETY

Zohar and Gil (2004), theorized that supervisory influence on safety practices has a direct relationship with the level of worksite safety climate. Mohamed (2002), also added that there is relationship between construction safety climate and the work safety behaviour in the construction work environment. However, Glendon and Debbie (2001), instigated that construction workers do not perceive a direct relationship between site safety climate and performance of construction safety. Dedobbeleer and Pearl (1987), also added to the argument that there is no relationship between the knowledge of construction workers on performance of safety and interventions of safety.

Lin and Mills (2001), instigated that the implementation of health and safety in various occupations is a major challenge due to fear of being prosecuted when one fails to meet the standards required for construction health and safety. It was further added that health and safety practices becomes a major burden especially to small firms where their financial strength is low. Helander (1991), added that hazards of safety are specific to the type of job being classified and also due to the fact that most construction workers underrate the risks associated with their work. Abdelhamid and John (2000), perceived the root factors of accidents as: Failure to identify unsafe working conditions before an

activity begins; proceeding with a particular work activity even after a defective condition has been identified; and acting unsafely regardless of the poor working conditions.

2.5.3 PROBLEMS ASSOCIATED WITH HEALTH AND SAFETY MANAGEMENT

Kartam et al. (2000), identified problems associated with construction safety and health management to include; unavailability of construction health and safety legislation and regulations, poor record keeping and reporting system for accidents, disorganized workforce, low priority given to issues regarding safety, extensive utilization of subcontractors and the smaller size of construction companies. O'Connor et al. (2005), postulated that the low level of English Language communication skills among the construction workers inhibits health and safety programs. Bust et al. (2008), instigated that there is a major challenge of altering the health and safety schemes to accommodate a cultural or multi-nationwide workforce. This will require the use of expensive initiatives such as, the use of interpreters, translation materials and an augmented use of pictorial methods for collaborating health and safety communications.

Teo et al. (2005), identified factors that influence safety performance negatively and increase the likelihood of accidents as including; derisory company policy, poor safety practices, unsafe attitudes of construction workers, poor commitment of management, inadequate knowledge on health and safety and inappropriate training of construction workers. Tam et al. (2004), revealed that problems associated with health and safety management include; inadequate provision of protective equipment, irregular meetings on site safety, inappropriate or lack of health and safety training, poor level of awareness of

management on health and safety, unwillingness of stakeholders to invest in safety resources and careless construction operations.

2.6 MEASURES TO PROMOTE OCCUPATIONAL HEALTH AND SAFETY

A safety performance measure is only appropriate when it prevents injuries from occurring at the construction site (Hinze and Raymond, 2003). An effective management should be employed to ensure safety performance at construction sites. It is revealed that onsite health and safety management is essential in identifying major hazards relating to construction work (Fang et al., 2004). A behaviour based methodology to health and safety management has been promoted by many researchers and has been confirmed to improve effectively the performance of safety in industrialised settings (Lingard and Rowlinson, 1998).

Toole (2002), proposed that there should be a balanced agreement regarding the role of designers, contractors, engineers, consultants and subcontractors in ensuring safety at the construction site. Proper assignments of responsibilities should depend on each personnel's ability to improve safety control measures. Hinze and Raymond (2003), posited that a survey should be conducted on the perception of workers and management on the safety of construction project. Innovative methodologies are needed for the promotion of health and safety at the worksite. He added that novel approaches will be particularly suitable for workers who often change their jobs and thus have inadequate access to promotional health and safety initiatives (Sorensen et al., 2007).

2.6.1 MEASURES THAT ENHANCE THE APPLICATION OF HEALTH AND SAFETY POLICIES IN THE CONSTRUCTION INDUSTRY

Cascio (2001), inferred that management should formulate a working policy of safety and to ensure its effective implementation at the construction site. He added that to enhance the policy's sustainability a health and safety programme should be developed, which involves four aspects such as: an effective record system for safety, a concrete budget, management commitment to health and safety, and the good exemplary practices performed by management. Dedobbeleer and François (1991), suggested that there is the need for management to address the concerns of workers when formulating the organization's safety policies.

Mastex (2014), theorized that workable policy should be formulated that seeks to;

- Provide effective control of the safety and health risks
- Maintain all equipment and plant in a good and safe working condition.
- Ensure safe handling and use of substances and chemicals.
- Consult with construction workers and client on safety matters.
- Provide adequate site instruction, information and supervision to workers.
- Provision of adequate safety training to workers.
- Ensure only competent workers carry out the construction works.
- Ensure construction tasks are performed in a safety manner.
- Maintain a healthy and safe working site conditions at all times.

- Assess potential hazards with the usage of public signalled.

The Government should play a role in the legal enforcement of health and safety regulations in the construction industry and should take part in the initiation of safety programs as proposed by Tam et al. (2004). Hinze and John (2003), instigated that measures that positively influence construction safety performance include minimizing or eliminating employee work turnover and increased growth in the size of a company. Hare et al. (2006), theorized that health and safety should be integrated at the preplanning stage of construction. He further added that design and construction management tools should be enhanced to mitigate the factors inhibiting the integration of a standard plan for health and safety.

Hinze and Raymond (2003), posited that safety inspections of the project should be conducted to provide information on the physical condition of the jobsite, so as to insure the works against jobsite injuries. Abudayyeh et al. (2006), instigated that the costs ensuing from worksite injuries may be eliminated or reduced through committed efforts of safety at the construction site. It was further postulated that there is a clear connexion between the commitment of management to safety and the frequency of injuries and illness relative to construction work.

However, Rulka (2004), juxtaposed that safety is the sole responsibility of construction workers in each trade, in order to mitigate safety risks and hazards. He added that the factories and stores act, confer responsibilities on workers to undertake the following practices: examine the safety of machinery before its operation, apply protective covering

to machine parts such as blades and wheels that might be exposed to bad conditions and undertake preventive maintenance services periodically.

2.6.2 Measures to improve Employee worksite safety

Rudin (2005), identified measures to ensure the safety of workers;

- Execute full verification of safety performance, processes and programmes against approved standards.
- Develop an effective safety reporting system
- Formulate a package for tracking and analysing jobsite accidents.
- Ensure continual involvement of contractors, management and safety and health practitioners to enhance safety performance.
- Maintain the work environment to approved Health and Safety Standards.

Gambatese et al. (2005), recommended that construction workers' safety should be taken into consideration during the design stage of the project. Design of the project should be professionally done to mitigate the jobsite safety hazards as this is one of the best and viable control measures for construction safety and health. Houtman and Bossche van den (2005), instigated that it is mandatory for employers to provide adequate equipment as protection for construction workers against noise, especially where the level of noise exceeds 85 decibels. In order to overcome such problems relating to safety, an implementation of a safety program has been identified as one of the significant methods (Aksorn and Hadikusumo, 2008).

O'Connor, et al. (2005), intimated that adequate training of health and safety should be provided to construction workers. A safety performance measure should be frequently employed depending on the industry's standard to eliminate the rate of incidence of injuries (Hinze and Raymond, 2003).

2.6.3 Measures to enhance Employee health and wellbeing

Gillen et al. (2002), theorized that there is the need for management of construction industry to create an awareness regarding the work practices that are dangerous and detrimental to the health of workers. They further added that construction workers who are committed to health and safety practices should be well acknowledged and rewarded, this will serve as an incentive for them to continue such act in a manner that is acceptable in the industry. These interventions will mitigate the severity and incidence of workplace accidents. Gambatese et al. (2005), resolved that there is the need for management to provide enough motivation to workers in order to realize the successful outcomes of implementing the safety and health concept in practice.

Lingard (2002), stipulated that training in first aid affects positively the employees' motivation especially for small scale construction organizations. This training help mitigate illnesses and injuries associated with the construction occupation and improves the workers' safety and health behaviour. First aid training also provides an awareness to participants to be responsible as their personal behaviour is a major contributing factor to the risk of injuries and illness. He concluded that first aid training has a positive effect in the prevention of health and safety risks and should complement occupational safety and

health training programs, as this would provide a lot of benefits to the construction organization.

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Rudin (2005), conjectured the following measures as necessary;

- Educate workers on dangerous practices that can lead to muscular-skeletal and mental health problems
- Adopt measures that will mitigate employee sick leave drastically
- Refer injured workers for medical attention immediately in the event of accident.
- Encourage safe and appropriate working methods

The key measures needed for the practical implementation of health and safety concept in design include: a change in the perception of designers toward construction safety; the need to establish a motivational measure to promote safety in designing; increase the level of awareness of designers on the concept safety; integrate the knowledge of construction safety in the design phase; employ competent designers who are knowledgeable about safety design modifications; make available safety tools, guidelines references for designers; and mitigate the exposure of designers to liability (Gambatese et al., 2005).

2.7 SUMMARY OF CHAPTER 2

With reference to the above information from numerous research works by respective researchers, it can therefore, be argued that, for construction works to be completed more effectively and efficiently, the welfare of individual employees in construction firms should be prioritized and managed accordingly as far as construction industries are concerned. Notwithstanding, there is much to be done in order to achieve effective implementation of occupational health and safety in Ghanaian construction firms.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Chapter three provides information on the procedures, design and methods used for the research. The methodology of the research deliberated on the strategies and procedures of the study as well as the type of data to be used in the study. It also provides a detailed description and evaluation of the methodological approach to the study. The choice of approach is however dependent on the nature of the study and the type of data required.

3.2 RESEARCH DESIGN AND APPROACH

The Research design adopted for the study is the descriptive research design. Research design denotes the structure and plan of the investigation used purposely for the attainment of the research objectives (Borg, 1992).

Research approach comes in two main types: namely qualitative research and quantitative research. The research study adopted the quantitative research approach

making use of survey questionnaire. Quantitative research is more precise and result oriented. It is also geared towards meeting the objectives of the study. Quantitative research involves the gathering of numerical data to elucidate, envisage, and/or control phenomena of research interest. Quantitative research assumes a positivist philosophy that emphasizes objectivity quantification of phenomena (Casley and Kumar, 1988).

3.3 DESIGN AND DEVELOPMENT OF STRUCTURED QUESTIONNAIRE

Structured questionnaire were self-administered for the survey. The questionnaire consisted of closed ended questions which focused on the subject matter and aimed to cover the objectives of the research. Basically the structure of the questionnaire was grouped under these;

1. Level of knowledge on occupational health and safety
 - Familiarity of the health and safety practices
 - Extent to which the concept of health and safety have been implemented.
 - Perception of construction professionals on the benefits of occupational health and safety.
2. Barriers to the full implementation of the health and safety concept.
3. Measures to mitigate the barriers inhibiting the incorporation of occupational health and safety in the Ghanaian construction industry.

The provision of the „other (please specify)“ option is included to reduce the

rigidity which may artificially constrain the responses. The use of close ended responses of (yes) or (no) were restricted and ranges of possible judgments were available to the respondent by the use of a five point Likert scale. For example, where respondents were requested to indicate their level of agreement on certain factors that inhibit or encourage the implementation of health and safety practices, the following qualifications were used; *'Strongly agree'* rated as 5 points, *'Agree'* rated as 4 points, *'Neutral'* 3 points, *'Disagree'* 2 points, and *'Strongly Disagree'* 1 point.

3.4 SOURCE OF DATA/DATA COLLECTION METHOD

The Two main kinds of data namely primary and secondary source were used.

3.4.1 Secondary data

Secondary source in the form of review of related literature were mainly obtained from documented written and non-written materials. These were used to obtain information on the subject area, from which questionnaires were prepared and administered.

3.4.2 Primary data

The primary data were from field work or survey through observation and the administration of structured questionnaires designed to gather information from stakeholders of large and medium scale construction firms in the Kumasi metropolis. The data collected were first checked for contradictions and to ensure consistency. The conditions for admissibility of field data and the treatment of the data were employed.

3.4.2.1 TARGET POPULATION

The target population was the study group that has been selected for the purpose of the research and whose results were generalized for the whole population (Hart, 2005). As far as this study is concerned, the target population was 32 construction firms who are registered with Kumasi Metropolitan Assembly.

A graphical representation of the target population must be provided (Badu - Nyarko, 2012). Hence, the company's name, address/ location and contact have been provided in the table below.

TABLE 3.4.1 LIST OF CONSTRUCTION FIRMS UNDER SURVEY

Source; <http://www.ghanayello.com/category/Contractors/1/city:Kumasi> (23/07/15; 14:30)

| ITEM | COMPANY NAME | ADDRESS/ LOCATION | CONTACT |
|------|--------------------------------------|---|---------------------------|
| 1. | Dream Side Construction | P.O. Box KS 608 Ghana, Kumasi | 0244728040 |
| 2. | Measurematics Consult Ltd. | Kentinkrono, Kumasi | 0322061826/ 0244363682 |
| 3. | Frederick Williams Construction Ltd. | Near Presby Church, Bohyen-Kumasi, Kumasi | 0322081513/ 0244205426 |
| 4. | Osraf Construction Ltd. | New Tafo Airport Rd., Dichemso, Ksi | 0244627624 |
| 5. | Ansufa Construction | D 86, NE 617 Link, Airport, Kumasi | 0244825265 |
| 6. | Calonsa Construction Ltd. | Plot 6 Block E, Santasi New Site,Ksi | 0262642965 |
| 7. | George Newyear Const. | Nsuom Junction, Kwadaso, Kumasi | 0244224047 |
| 8. | Adomkop Construct Ltd. | IRS Office Bldg., Ash-Town, Kumasi | 0322028527 |
| 9. | A.J. Fanj Construction Ltd | Industrial Area, Asokwa, Kumasi | 0322023326 |
| 10. | Casdice Construction Ltd. | No. 47 Kwadaso Estate, Kumasi | 03220378165 |
| 11. | Obeng Engineering Complex | Suame Magazine, Kumasi | 0322020435/ 0244460208 |
| 12. | Potential Eng. Co. Ltd. | Prempeh II Street, Adum, Kumasi | 0322030207 |
| 13. | Value Trust Estates | Kumasi | 0322037679 |
| 14. | Ankomadu Const. Ltd. | Plot 11, Blk. K, Ayigya, Kumasi | 0322060266 |
| 15. | ASIB Const. Ltd. | P.O.BOX KS 77, Kumasi, Ghana | 03220 273 85 |
| 16. | Asofat Construction | Harbour Area, Kumasi | 0312022793 |

| | | | |
|-----|--------------------------------------|--|-------------|
| 17. | Canash Const Works Ltd. | No. 113, Kwadaso Estate, Kumasi | 0322025719 |
| 18. | CECIL BON C _i | P.O.BOX SE 1930, Kumasi, Ghana | 03220810 97 |
| 19. | Consar Ltd. | Industrial Area, Asokwa, Kumasi | 0322025594 |
| 20. | Fridoug Construction Ltd. | Next To SSNIT Office, Asafo, Ksi. | 0322045103 |
| 21. | Jodon's Building & Road Construction | Opp. Ghana Commercial Bank, Asafo Market, Kumasi | 0322027547 |
| 22. | Jomallin Enterprise Ltd. | Kumasi | 0244664363 |
| 23. | Justmoh Construction Ltd. | Adum, Kumasi | 0322020732 |
| 24. | Kayad Co. Ltd. | Mile 3, Old Tafo, Kumasi | 0322024938 |
| 25. | Knatto Complex Ltd. | Santasi, Anyinam, Kumasi | 0322023766 |
| 26. | Mahphus Construction Ltd | P.O. Box 47 Aboabo Kumasi | 0266873068 |
| 27. | M Barbisotti & Sons | P.O.Box 1604, Kumasi, Ghana | 0322024294 |
| 28. | Nabbco Building & Trading Co. | 201, Chapel Hill, Kumasi | 0312024862 |
| 29. | Nuclear Age Const. Ltd. | Ashanti New Town, Kumasi | 0322024687 |
| 30. | Nyamaa Bldg. Const. | Manhyia Antoa Rd., Kumasi | 0322025091 |
| 31. | Sethi Brothers | P.O.BOX KS 3353, Kumasi, Ghana | 0322021632 |
| 32. | Tyla Contract Works Ltd. | SSNIT Annex, Adum, Kumasi | 0322027958 |

The research was conducted in all the 32 construction firms listed in the table. Structured questionnaires of within the range of 1-5 number were sent to each of the construction firms. The distribution of the questionnaire was done based on the sampling approach adopted.

3.5 SAMPLING APPROACH

In research techniques, there are two primary categorizations for sampling approaches: non-probability and probability.

A non-probability sampling approach was adopted for the study, using snowball sampling method. As non- probability sampling approach is more preferred where the population is undefined and indefinite. A non- probability method of sampling is also fast in it approach and has relatively cheap cost associated with the method of data gathering (Norusis, 2001).

Purposive Sampling is a method used to obtain relevant information and knowledge from persons based on the judgement of the researcher (Borg, 1992). The main aim of purposive sampling is to focus on extensive characteristics of a population that are of interest. In using this approach, the researcher contacted the most visible and easy to reach construction professionals in the metropolis for the questionnaire administration. The purposive sampling method was also used to identify respondents with rich information that are relevant to the study. The process continued till representative sample sizes of hundred (100) respondents were obtained.

3.6 ANALYSIS OF DATA

The data collected were organized and coded and subjected to analysis using Statistical Package for Social Scientists, version 19. The study utilized both descriptive and inferential statistics in analyzing the data and also conclusions were drawn from them.

3.6.1 Descriptive Statistics

Descriptive statistics was used to analyze the data by describing and or summarizing data in a meaningful way. This allows for simpler interpretation, such that patterns can be derived from the data. Descriptive statistics analyze data by employing two forms of statistical methods namely measures of central tendency and measures of spread.

Measures of central tendency were used to describe the central location of a frequency distribution using statistical forms such as median, mean and mode.

Measures of spread were used to summarize the data by indicating how the results of the data groups have been spread out. A number of statistical tools were used to describe the spread which includes range and standard deviation. In using descriptive statistics, the data were summarized using a combination of tables, charts and graphs.

3.6.2 Inferential Statistics

Inferential Statistics were used to reach conclusions that extend beyond the immediate data. The statistical model of inferential statistics adopted for the study was one sample T-test. One sample T-test was used to assess whether the means of a group statistically differ from one another. This form of analysis is appropriate for comparing the means of a group (Norusis, 2001).

3.7 ETHICAL CONSIDERATIONS

Every research requires that the researcher gives attention to appropriate research ethics and this study is not exemption. Voluntarily, respondents were allowed to participate in the study based on their free will. The researcher also assured prospective respondents that the study result will not place any respondents at risk of criminal or civil liability nor damage respondents' financial standing, employability or reputation.

Anonymity and personal information of respondents were treated with confidentiality.

3.8 SUMMARY OF CHAPTER 3

This chapter accounts for the research design, target population, study population, sample unit, sample frame, sampling techniques and sample and the required sample size that will be considered by the researcher. The chapter also presents methods and instruments that will be used to obtain the relevant information for this study. Data handling, data analysis as well as ethical considerations were considered.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

The study was conducted to investigate the factors inhibiting the implementation of occupational health and safety in the Ghanaian Construction Industry. This chapter deals with the analysis of the raw data collected from the field, interpretation of the data and discussions of the findings. The statistical analysis tools used for the presentations and analysis of the data were both the technique of descriptive statistics and inferential statistics. Frequency distribution tables and charts were used in the analysis since they enable readers to get vivid picture from the result of the study.

4.2 SURVEY RESPONSE AND RESPONDENTS PROFILE

A total number of Hundred (100) questionnaires were disseminated to 32 construction firms in Kumasi. All questionnaires were received to generate a response rate of 100%.

Two methods were adopted in delivering the questionnaires, being the Hand-Delivery method and Electronic-mail (e-mail) method.

About 38% of the construction organizations contacted belong to D1K1, 40% belong to D2K2, 10% belong to D3K3 and 12% belong to D4K4 construction classification. Among the hundred (100) respondents, forty-three (43) were contractors, twenty-four (24) were Architects, twenty-one (21) were Engineers and twelve (12) were Quantity Surveyors.

The percentage of the construction professionals contacted under this survey has been illustrated in the form of a Pie chart in Figure 4.1 below.

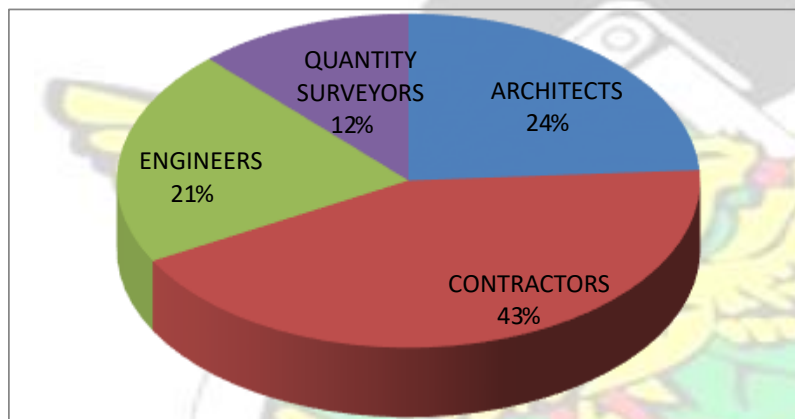


Figure 4.1 Percentage distribution of the construction professionals contacted

The respondents were also categorized according to their work experience measured in terms of number of years practiced. This result is well illustrated in Figure 4.2 below.

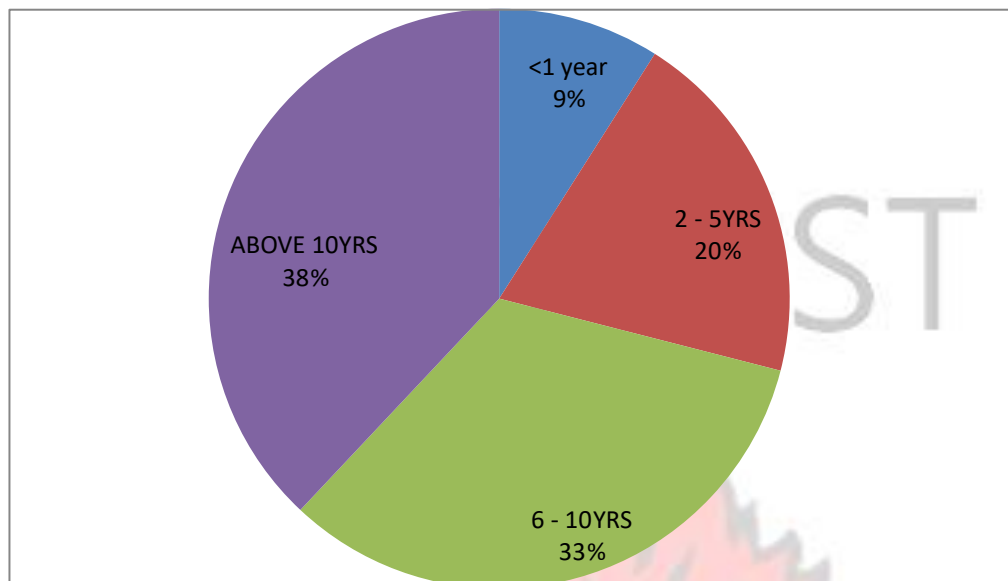


Figure 4.2 Percentage distribution of respondents' length of years of practice

4.3 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT

The respondents were asked to identify the personnel in charge of work safety and employee's health in their company. About 57% of the respondents indicated that a desk officer was employed to be in charge of work safety and first aid services. Less than 50% of the respondents indicated that managers and supervisors were responsible for ensuring health and safety at the workplace.

The respondents were asked to indicate the educational level of the health and safety personnel employed in their company. The survey revealed that about half of the health and safety personnel employed in construction companies have their educational background to the level of GCE "O" and GCE "A". The result of the survey is illustrated in Figure 4.3.

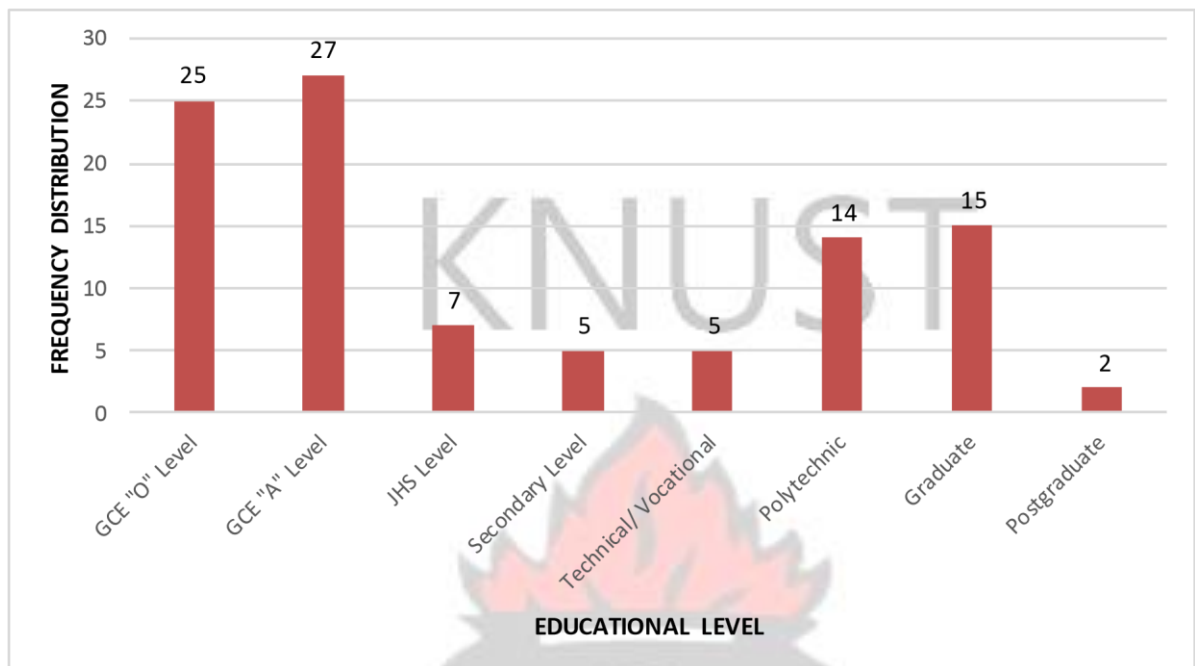


Figure 4.3 Frequency distribution of the level of education of health personnel employed in the respondent's company.

The respondents were asked to indicate how frequent accidents occur at their workplace. Eighty (80) of the respondents indicated that sometimes accidents occur at their construction sites. Twelve (12) of the total respondents indicated that accidents occur almost every day at their workplace. Eight (8) of the respondents insisted that accidents barely occur at their construction site. Their responses have been presented in the Figure 4.4 below.

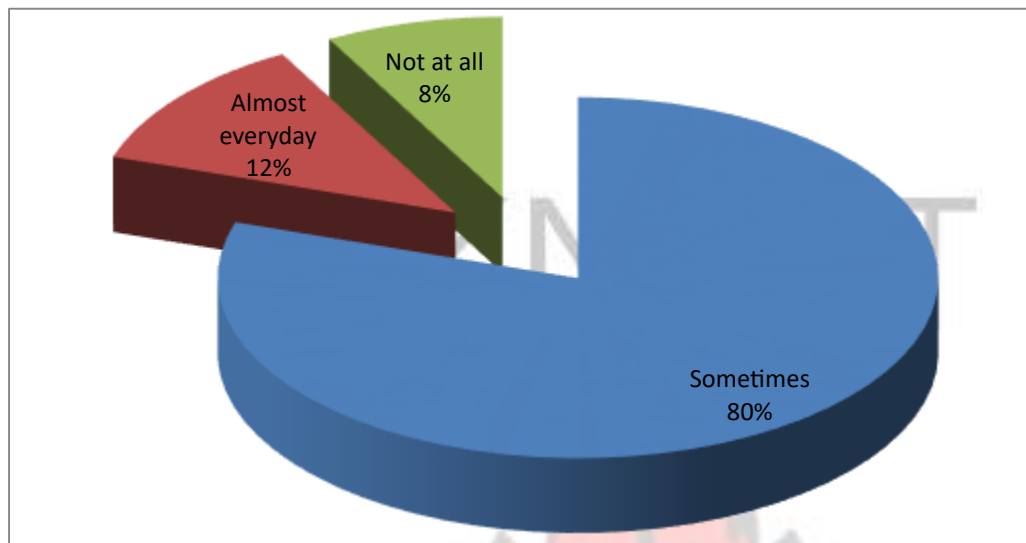


Figure 4.4 Percentage distribution of how frequent accidents occur on construction site.

4.4 LEVEL OF AWARENESS ON OCCUPATIONAL HEALTH AND SAFETY

This part of questionnaire seeks to establish the level of awareness of construction stakeholders on occupational health and safety. The respondents were asked to indicate the level of utilization of the health and safety regulation which are operational in the selected construction firms. The result of the survey is illustrated in Figure (4.5) below.

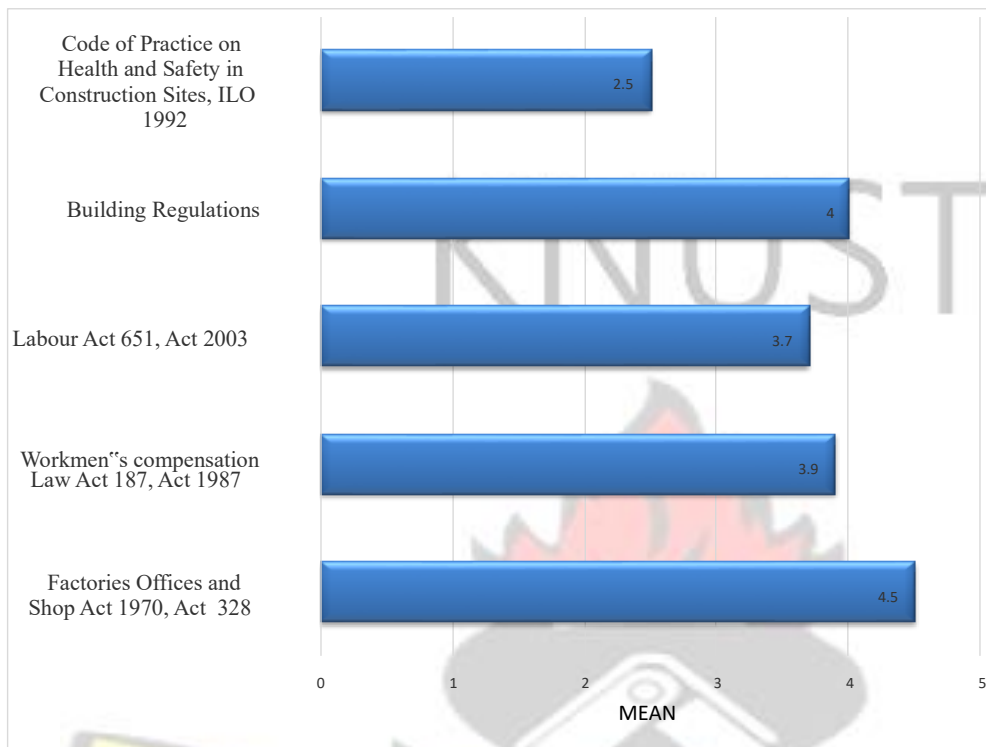


Figure 4.5- Mean distribution of the utilization level of health and safety regulations.

The study revealed that over 50% of the construction firms under this survey were aware of the existence of all the regulations relating to Construction Health and Safety. About 80% utilized the Factories, Offices and Shop Act in their organization and about 60% of the respondents were familiar with the Workmen's compensation Law.

4.5 OCCUPATIONAL HEALTH AND SAFETY PRACTICES

Below is a list of possible occupational health and safety practices in the Ghanaian construction industry. These practices were ranked on a likert scale of 1-5 by the construction professionals and after been analyzed by comparing the mean and standard deviation of the various practices. The highly practiced item having the highest mean was identified. The results have been illustrated in Table (4.1) and Table (4.2).

This study utilized 95% confidence intervals, which is equivalent to statistical significance of $p < 0.05$ level. Table (4.2) shows the degrees of freedom ("df"), the observed t -value ("t" column), and the statistical significance (p -value) ("Sig. (2-tailed)") of the one-sample t -test. Where $p < .05$, it indicates that the population mean and the sample mean are statistically significantly different. But where $p > .05$, the difference between the sample-estimated population mean and the comparison population mean would not be statistically significantly different.

The results depict that, there are 99 degrees of freedom ("df" column), obtained from the formula $(N - 1)$. From the "t" column, Posting of safety signs, notices and newsletters on health and safety has the highest obtained t -value of 40.194 when compared to a t -distribution (t -test). The "**Sig. (2-tailed)**" indicates the probability of obtaining the observed t -value was ".000", which means that $p < .0005$ and does not imply that the significance level is zero. The mean difference of the highest mean from the "**Mean Difference**" column is 2.800. At the 95% confidence intervals (95% CI) the difference from the "**Lower**" to "**Upper**" columns of the highest mean are 2.68 to 2.92.

Table 4.1- One sample statistics on occupational health and safety practices.

| Id | Practices | N | Mean | Std. Deviation | Std. Error Mean |
|-----------|--|----------|-------------|-----------------------|------------------------|
| 1. | Posting of safety signs, notices and availability of newsletters on health and safety. | 100 | 4.28 | 0.800 | .062 |
| 2. | Periodic inspection and maintenance of plants and machines | 100 | 4.09 | 0.826 | .080 |
| 3. | Utilization and availability of personal protective clothing and equipment | 100 | 3.87 | 0.943 | .095 |

| | | | | | |
|-----|--|-----|------|-------|------|
| 4. | Provision of safety policies and booklets | 100 | 3.64 | 0.767 | .121 |
| 5. | Provision of welfare facilities such as first aid services and referral | 100 | 3.21 | 0.898 | .090 |
| 6. | Replacement and repair of obsolete and broken machines | 100 | 3.14 | 0.768 | .072 |
| 7. | Regular monitoring of the environmental condition of the workplace | 100 | 3.08 | 0.672 | .094 |
| 8. | Inspection and regular meeting on job safety | 100 | 2.85 | 1.209 | .077 |
| 9. | Full time employment of occupational health and safety personnel at the site | 100 | 2.69 | 0.950 | .053 |
| 10. | On the job training and education on the use of personal protective equipment. | 100 | 2.59 | 0.621 | .047 |
| 11. | Formal training on occupational health and safety practices | 100 | 2.42 | 0.817 | .059 |
| 12. | Reporting any contravention of the safety policies to authorities | 100 | 2.15 | 0.725 | .046 |
| 13. | Periodic risk assessment on occupational safety | 100 | 2.00 | 0.523 | .062 |
| 14. | Operating under safety zone | 100 | 1.98 | 0.431 | .054 |
| 15. | Compliance with all safety standards at the workplace | 100 | 1.89 | 0.328 | .049 |

Table 4.2- One Sample Test on occupational health and safety practices.

| ID | PRACTICES | Test Value = 2 | | | | | |
|----|--|----------------|----|----------------|-----------------|---|-------|
| | | t | df | Sig. (2tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| 1. | Posting of safety signs, notices and newsletters on health and safety. | 40.194 | 99 | .000 | 2.28 | 2.68 | 2.92 |

| | | | | | | | |
|-----|--|--------|----|------|-------|------|------|
| 2. | Periodic inspection and maintenance of plants and machines | 32.919 | 99 | .000 | 2.09 | 2.42 | 2.76 |
| 3. | Utilization and availability of personal protective clothing and equipment | 28.000 | 99 | .000 | 1.87 | 1.92 | 2.24 |
| 4. | Provision of safety policies and booklets | 26.237 | 99 | .000 | 1.64 | 2.11 | 2.53 |
| 5. | Provision of welfare facilities such as first aid services and referral | 24.090 | 99 | .000 | 1.21 | 2.11 | 2.55 |
| 6. | Replacement and repair of obsolete and broken machines | 20.821 | 99 | .000 | 1.14 | 1.93 | 2.37 |
| 7. | Regular monitoring of the environmental condition of the workplace | 17.702 | 99 | .000 | 1.08 | 1.48 | 1.86 |
| 8. | Inspection and regular meeting on job safety | 17.281 | 99 | .000 | 1.85 | 1.75 | 2.21 |
| 9. | Full time employment of occupational health and safety personnel at the site | 16.167 | 99 | .000 | 0.69 | 1.09 | 1.39 |
| 10. | On the job training on the use of personal protective equipment. | 15.921 | 99 | .000 | 0.59 | 1.66 | 2.14 |
| 11. | Formal training on occupational health and safety practices | 14.910 | 99 | .000 | 0.42 | 1.81 | 2.33 |
| 12. | Reporting any contravention of the safety policies to authorities | 13.797 | 99 | .000 | 0.15 | 1.60 | 2.10 |
| 13. | Periodic risk assessment on occupational safety | 10.914 | 99 | .000 | 0.00 | .71 | 1.07 |
| 14. | Operating under safety zone | 9.747 | 99 | .000 | -0.02 | .00 | .38 |
| 15. | Compliance with all safety standards at the workplace | 8.549 | 99 | .000 | -0.11 | .31 | .79 |

4.6 FAMILIARITY WITH PERSONAL PROTECTIVE DEVICES

Respondents were asked about the kind of personal protective devices they are familiar with to establish their level of awareness of the protective devices. The result is illustrated in Figure (4.6) below.

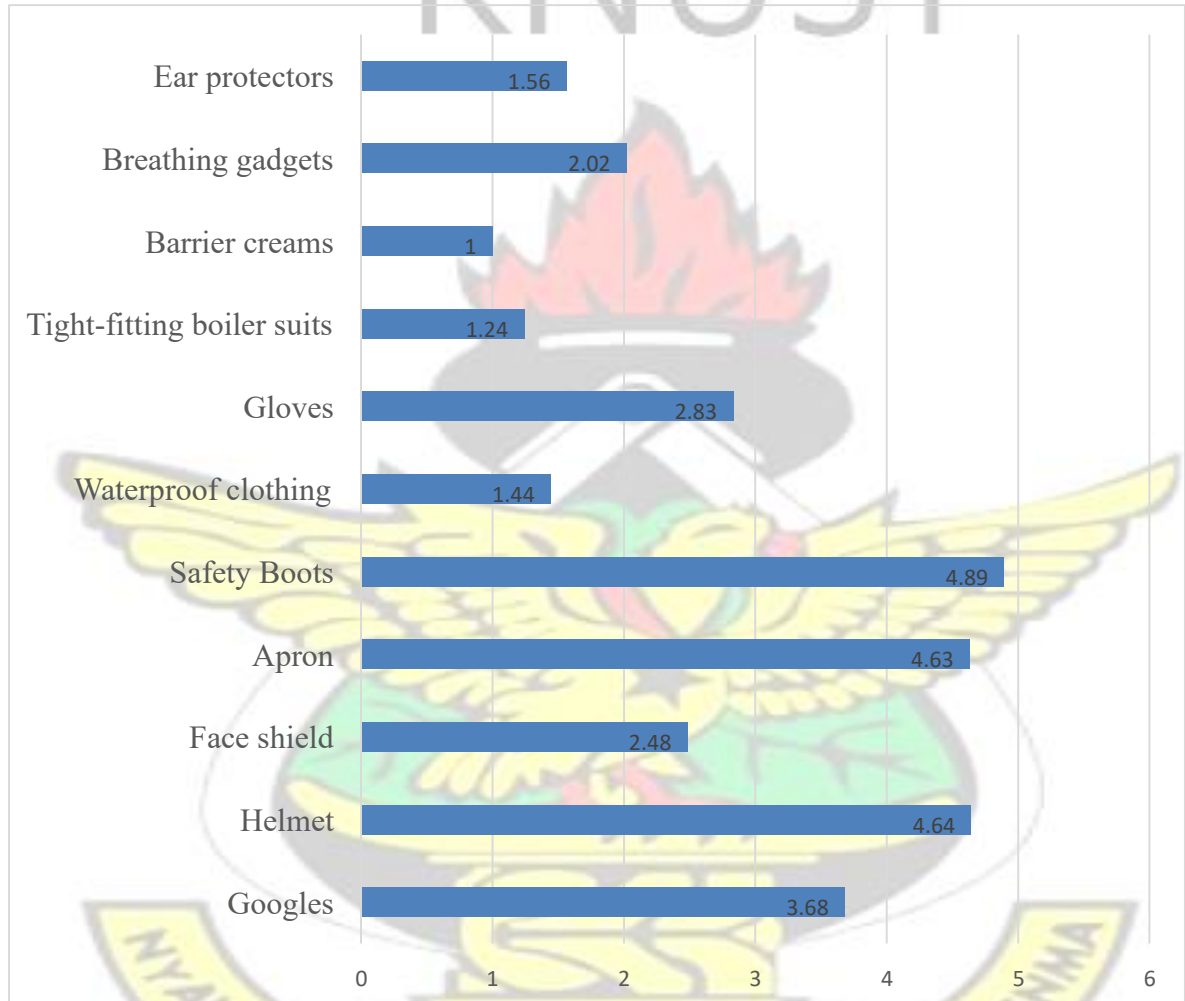


Figure 4.6: Mean distribution of the familiarity of Protective devices.

The survey indicates that there is some level of awareness among the selected Ghanaian consultants and contractors concerning the existence of personal protective devices and clothing.

4.7 EXTENT OF IMPLEMENTATION OF HEALTH AND SAFETY

The respondents were asked some general questions on occupational health and safety as practiced in their construction organizations. These questionnaires were set to establish the extent of incorporation of occupational health and safety in the construction firms surveyed. The respondents were provided with “Yes” and “No” options, but where the respondents had little or no knowledge of the subject matter the “Not sure” option was selected. The total frequency was 100 respondents for each question. The results have been illustrated in Table (4.3) and Table (4.4).

Table 4.3 One Sample Statistics on the extent of implementation of OHS

| ID | EXTENT OF OCCUPATIONAL HEALTH AND SAFETY | N | Mean | Std. Deviation | Std. Error |
|-----|--|-----|------|----------------|------------|
| 1. | Occupational hazards are normal with the operations of construction workplace | 100 | 4.80 | 0.620 | 0.062 |
| 2. | Full medical coverage is provided for injured workers | 100 | 4.59 | 0.866 | 0.087 |
| 3. | Non- insurance policy holders can make claim for injury benefits | 100 | 4.54 | 0.915 | 0.091 |
| 4. | Victims are compensated for accidents | 100 | 4.32 | 1.043 | 0.104 |
| 5. | Provision of regular first aid services for employees | 100 | 4.19 | 1.245 | 0.124 |
| 6. | Company have insurance cover for these accidents | 100 | 4.05 | 1.282 | 0.128 |
| 7. | Company keep records of these accidents | 100 | 3.98 | 1.146 | 0.115 |
| 8. | Insurance premium are expensive requirement | 100 | 3.90 | 1.193 | 0.119 |
| 9. | Insurance policy cover all construction workers | 100 | 3.85 | 1.250 | 0.125 |
| 10. | Provision of visual signals, posters and newsletters on occupational health and safety | 100 | 3.79 | 1.380 | 0.138 |
| 11. | Injured workers are replaced in my company | 100 | 3.77 | 1.420 | 0.142 |
| 12. | Occupational safety policy is a requirement for only large construction companies | 100 | 3.47 | 1.359 | 0.136 |
| 13. | Health and safety policies are being implemented in my organizations | 100 | 3.09 | 1.264 | 0.126 |

| | | | | | |
|-----|---|-----|------|-------|-------|
| 14. | Employment of a full-time occupational health and safety officer | 100 | 2.92 | 1.212 | 0.121 |
| 15. | Organization of health and safety training programs for employees | 100 | 2.88 | 1.174 | 0.117 |
| 16. | Enforcement of the utilization of protective devices | 100 | 2.86 | 1.181 | 0.118 |
| 17. | Establishment of a safety committee | 100 | 2.73 | 1.109 | 0.111 |
| 18. | There is an existence of occupational health and safety policy in my company | 100 | 2.69 | 1.089 | 0.109 |
| 19. | Accidents that occur at the workplace are reported to the appropriate agencies | 100 | 2.68 | 0.839 | 0.084 |
| 20. | There punishment for you when you go against the health and safety policies of the organization | 100 | 2.55 | 0.989 | 0.099 |
| 21. | Performance of regular evaluation and monitoring of work safety system | 100 | 2.34 | 0.977 | 0.068 |
| 22. | Organization of pre-employment medical examination | 100 | 2.23 | 0.777 | 0.078 |
| 23. | Organization of periodic medical screening for employees | 100 | 2.16 | 0.507 | 0.051 |
| 24. | Existence of a clinic for the provision of health services | 100 | 2.03 | 0.300 | 0.030 |

Table 4.4- One Sample Test on the extent of implementation of OHS

| ID | PERCEPTION | Test Value = 2 | | | | | |
|----|---|----------------|----|----------------|-----------------|---|-------|
| | | t | df | Sig. (2tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| 1. | Occupational hazards are perceived to be normal with the operations of construction | 45.194 | 99 | .000 | 2.800 | 2.68 | 2.92 |
| 2. | Full medical coverage is provided for injured workers | 29.919 | 99 | .000 | 2.590 | 2.42 | 2.76 |
| 3. | Non- insurance policy holders can claim for injury benefits | 27.767 | 99 | .000 | 2.540 | 2.36 | 2.72 |
| 4. | Victims are compensated for accidents | 22.237 | 99 | .000 | 2.320 | 2.11 | 2.53 |
| 5. | Provision of regular first aid services for employees | 21.090 | 99 | .000 | 2.333 | 2.11 | 2.55 |

| | | | | | | | |
|-----|---|--------|----|------|-------|------|------|
| 6. | Company have insurance cover for these accidents | 19.821 | 99 | .000 | 2.150 | 1.93 | 2.37 |
| 7. | Company keep records of these accidents | 17.594 | 99 | .000 | 2.190 | 1.94 | 2.44 |
| 8. | Insurance premium are expensive requirement | 17.281 | 99 | .000 | 1.980 | 1.75 | 2.21 |
| 9. | Insurance policy cover all construction workers | 15.989 | 99 | .000 | 2.050 | 1.80 | 2.30 |
| 10. | Provision of visual signals, posters and newsletters on OHS | 15.921 | 99 | .000 | 1.900 | 1.66 | 2.14 |
| 11. | Injured workers are replaced in my company | 15.910 | 99 | .000 | 2.067 | 1.81 | 2.33 |
| 12. | Occupational safety policy is a requirement for only large construction companies | 14.797 | 99 | .000 | 1.850 | 1.60 | 2.10 |
| 13. | Health and safety policies are being implemented | 14.202 | 99 | .000 | 2.100 | 1.80 | 2.40 |
| 14. | Employment of a full-time occupational health officer | 13.747 | 99 | .000 | 1.746 | 1.49 | 2.00 |
| 15. | Organization of health and safety training for employees | 12.969 | 99 | .000 | 1.790 | 1.52 | 2.06 |
| 16. | Enforcement of the utilization of protective devices | 12.483 | 99 | .000 | 1.800 | 1.51 | 2.09 |
| 17. | Establishment of a safety committee | 12.462 | 99 | .000 | 1.770 | 1.49 | 2.05 |
| 18. | Existence of occupational health and safety policy | 12.352 | 99 | .000 | 2.033 | 1.70 | 2.36 |
| 19. | Accidents that occur at the workplace are reported to the appropriate agencies | 11.551 | 59 | .000 | 1.717 | 1.42 | 2.01 |
| 20. | There punishment for you when you go against the health and safety policies | 10.815 | 99 | .000 | 1.470 | 1.20 | 1.74 |
| 21. | Performance of regular evaluation and monitoring of work safety system | 9.721 | 59 | .000 | 1.633 | 1.30 | 1.97 |

| | | | | | | | |
|-----|--|-------|----|------|-------|------|------|
| 22. | Organization of preemployment medical examination | 9.033 | 51 | .000 | 2.769 | 2.15 | 3.38 |
| 23. | Organization of periodic medical screening for employees | 8.623 | 99 | .000 | 1.090 | .84 | 1.34 |
| 24. | Existence of a clinic for the provision of health services | 8.101 | 99 | .000 | .680 | .51 | .85 |

The highest score (4.80 ± 0.620) was “Occupational hazards are normal with the operations of construction”, with obtained t- value 45.194, statistically significant difference of 2.800 (95% CI, 2.68 to 2.92), $t(99) = p = .000$.

4.8 BENEFITS OF OCCUPATIONAL HEALTH AND SAFETY COMPLIANCE

The respondents were asked to indicate what they perceive are the benefits of the practice of occupational health and safety by ranking them on a likert scale of 1 -5, the results were then analyzed by comparing the mean of the various benefits of occupational health and safety. The results have been illustrated in Table (4.5) and Table (4.6) in the order of the most beneficial factor to the least beneficial factor as perceived by the respondents.

Table 4.5: One sample statistics on the perceived benefits of OHS

| Id | Benefits | N | Mean | Std. Deviation | Std. Error |
|----|---|-----|------|----------------|------------|
| 1. | Likely reduction in the occurrence of injuries, illness or death at the jobsite | 100 | 4.76 | .429 | .043 |
| 2. | Create awareness of dangerous work practices | 100 | 3.98 | .710 | .071 |
| 3. | Promote sound and cordial working environment | 100 | 3.09 | .683 | .068 |
| 4. | Increase the morale and work quality of employees | 100 | 2.34 | .639 | .064 |

| | | | | | |
|----|---|-----|------|------|------|
| 5. | Enhance effective communication at the construction site | 100 | 1.62 | .508 | .051 |
| 6. | Mitigate cost associated with recruiting new workers to replace injured workers | 100 | 2.79 | .591 | .059 |
| 7. | Avoid uninsured medical costs to the company | 100 | 3.98 | .724 | .072 |
| 8. | Eliminate overtime work | 100 | 2.78 | .746 | .075 |
| 9. | Project delivered successfully on time and to cost | 100 | 4.25 | .672 | .067 |

Table 4.6- One Sample Test on the perceived benefits of OHS

| ID | Benefits | Test Value = 2 | | | | | |
|----|---|----------------|----|----------------|-----------------|---|-------|
| | | t | df | Sig. (2tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| 1. | Likely reduction in the occurrence of injuries, illness or death at the jobsite | 46.300 | 99 | .000 | 2.760 | 2.67 | 2.85 |
| 2. | Project delivered successfully on time and to cost | 33.466 | 99 | .000 | 2.250 | 2.12 | 2.38 |
| 3. | Create awareness on dangerous work practices | 27.872 | 99 | .000 | 1.980 | 1.84 | 2.12 |
| 4. | Avoid uninsured medical costs to the company | 27.331 | 99 | .000 | 1.980 | 1.84 | 2.12 |
| 5. | Promote sound and cordial working environment | 15.958 | 99 | .000 | 1.090 | .95 | 1.23 |
| 6. | Mitigate cost associated with recruiting new workers to replace injured workers | 13.365 | 99 | .000 | .790 | .67 | .91 |
| 7. | Eliminate overtime work | 10.450 | 99 | .000 | .780 | .63 | .93 |
| 8. | Increase the morale and work quality of employees | 5.320 | 99 | .000 | .340 | .21 | .47 |
| 9. | Enhance effective communication at the construction site | -7.479 | 99 | .000 | -.380 | -.48 | -.28 |

The study identified that, the highest Perceived benefit score (4.760 ± 0.429) was “Likely reduction in the occurrence of injuries, illness or death at the jobsite”, with obtained t-value of 46.300, a statistically significant difference of 2.760 (95% CI, 2.67 to 2.85), $t(99) = p = .000$.

4.9 IMPLICATIONS OF THE NON-COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY

The respondent were asked to indicate the level of frequency of some occupational health hazards that are common at the construction work site. Figure (4.7) illustrates the mean distribution of the responses. The study revealed that the minor cuts were very common occurrences at the construction workplace. It was also indicated that workers were also prone to the danger of fracture and contusions of fingers.

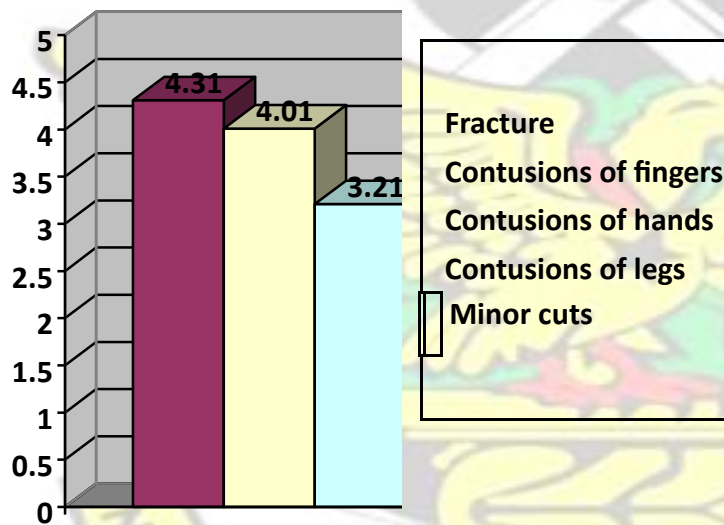


Figure 4.7 Mean distribution of occupational injuries at construction sites.

4.10 GENERAL BARRIERS ASSOCIATED WITH THE IMPLEMENTATION OF HEALTH AND SAFETY PRACTICES

A list is given of possible factors acting as barriers to the implementation of occupational health and safety. The respondents were asked to rank on the likert scale of 1 – 5 the reasons or factors to come up with the most likely barriers as they experience in their work. The results were then analyzed and presented in Table (4.7) and Table (4.8) below. The factors have been placed in the order of most influential factor to least influential factor.

Table 4.7 One Sample Statistics on barriers to the implementation of OHS

| Id | Barriers | N | Mean | Std. Deviation | Std. Error |
|-----------|--|----------|-------------|-----------------------|-------------------|
| 1. | Disorganized and transient workforce | 100 | 4.68 | 0.469 | 0.062 |
| 2. | Temporary nature of the work | 100 | 4.66 | 0.476 | 0.087 |
| 3. | Unwillingness to input resources in occupational health and safety | 100 | 4.51 | 0.562 | 0.091 |
| 4. | Poor commitment of management to safety policies | 100 | 4.340 | 0.714 | 0.104 |
| 5. | Unavailability and insufficient OHS policy | 100 | 4.280 | 0.683 | 0.124 |
| 6. | little priority given to OHS | 100 | 3.830 | 0.943 | 0.128 |
| 7. | High cost of health and safety practices | 100 | 3.120 | 0.752 | 0.115 |
| 8. | Reckless operations | 100 | 3.110 | 0.769 | 0.119 |
| 9. | Poor attitudes of construction workers to safety practices | 100 | 2.970 | 0.717 | 0.125 |
| 10. | Low educational background of workers | 100 | 2.930 | 1.265 | 0.138 |
| 11. | Psychological, human and historical factors | 100 | 2.720 | 1.030 | 0.142 |
| 12. | Limited access to health and safety promotion programs | 100 | 2.700 | 1.059 | 0.136 |
| 13. | Unavailability of safety tools and equipment | 100 | 2.690 | 0.813 | 0.126 |
| 14. | Lack of knowledge on safety policies and practices | 100 | 2.340 | 0.681 | 0.121 |
| 15. | Type and method of construction adopted | 100 | 2.010 | 0.771 | 0.117 |

| | | | | | |
|-----|---------------------------------------|-----|-------|-------|-------|
| 16. | Inadequate health and safety training | 100 | 2.006 | 1.181 | 0.118 |
|-----|---------------------------------------|-----|-------|-------|-------|

Table 4.8- One Sample Test on barriers to the implementation of OHS

| ID | Barriers | Test Value = 2 | | | | | |
|-----|--|----------------|----|-------------------|--------------------|---|-------|
| | | t | df | Sig. (2tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| 1. | Disorganized and transient workforce | 35.924 | 99 | .000 | 2.680 | 2.48 | 2.82 |
| 2. | Temporary nature of the work | 30.719 | 99 | .000 | 2.660 | 2.52 | 2.76 |
| 3. | Unwillingness to input resources in occupational health and safety | 29.267 | 99 | .000 | 2.510 | 2.36 | 2.72 |
| 4. | Poor commitment of management to safety policies | 28.307 | 99 | .000 | 2.340 | 2.21 | 2.54 |
| 5. | Unavailability and insufficient OHS policy | 27.290 | 99 | .000 | 2.280 | 2.19 | 2.45 |
| 6. | little priority given to OHS | 25.821 | 99 | .000 | 1.830 | 1.74 | 2.17 |
| 7. | High cost of health and safety practices | 23.594 | 99 | .000 | 1.120 | 1.084 | 1.34 |
| 8. | Reckless operations | 20.851 | 99 | .000 | 1.110 | 1.05 | 1.21 |
| 9. | Poor attitudes of construction workers to safety practices | 19.809 | 99 | .000 | 0.970 | 0.80 | 1.30 |
| 10. | Low educational background of workers | 18.921 | 99 | .000 | 0.930 | 0.76 | 1.14 |
| 11. | Psychological, human and historical factors | 17.910 | 99 | .000 | 0.720 | 0.681 | 1.23 |
| 12. | Limited access to health and safety promotion programs | 16.797 | 99 | .000 | 0.700 | 0.60 | 1.10 |
| 13. | Unavailability of safety tools and equipment | 15.202 | 99 | .000 | 0.690 | 0.580 | 1.40 |
| 14. | Lack of knowledge on safety policies and practices | 14.747 | 99 | .000 | 0.340 | 0.249 | 0.50 |
| 15. | Type and method of construction adopted | 13.969 | 99 | .000 | 0.010 | 0.005 | 0.16 |

| | | | | | | | |
|-----|---------------------------------------|--------|----|------|-------|-------|-------|
| 16. | Inadequate health and safety training | 12.873 | 99 | .000 | 0.006 | 0.005 | 0.009 |
|-----|---------------------------------------|--------|----|------|-------|-------|-------|

All the other items making up the list of possible barriers above were also considered as significant points to be noted, since their mean score were above 2.0.

4.11 MEASURES FOR ACHIEVING EFFECTIVE OHS

This section of the questionnaire is to assess the best measures to overcome the barriers identified to be the major causes of the slow pace in the implementation of the concept of OHS in the Ghanaian construction industry. Using observation and secondary data, 37 measures were identified from the research study. The respondents were asked to rank on the likert scale of 1 – 5 their level of agreement to these measures. The results were analyzed and summarized, ranging from the most significant measure to the least significant measure as presented in Table (4.9) and Table (4.10).

Table 4.9: One sample statistics on measures to promote OHS

| Id | Measures | N | Mean | Std. Deviation | Std. Error |
|-----------|---|----------|-------------|-----------------------|-------------------|
| 1. | Create an awareness on health and safety | 100 | 4.985 | 0.310 | 0.062 |
| 2. | Make provision for regular health services at the construction workplace | 100 | 4.976 | 0.423 | 0.087 |
| 3. | Adherence to regulations, legislation and standards of occupational health and safety | 100 | 4.964 | 0.613 | 0.091 |
| 4. | Make provision for personal protective equipment and enforce the utilization of them. | 100 | 4.951 | 0.597 | 0.104 |
| 5. | Undertake a safety risk assessment periodically | 100 | 4.932 | 0.349 | 0.124 |
| 6. | Establish a functional safety committee | 100 | 4.820 | 0.409 | 0.128 |
| 7. | Establish a health clinic at workplace. | 100 | 4.790 | 0.461 | 0.115 |
| 8. | Appoint a safety officer on a full time basis. | 100 | 4.701 | 0.522 | 0.119 |
| 9. | Ensure the awareness of health and safety standards required by all regulations | 100 | 4.650 | 0.537 | 0.125 |
| 10. | In-house training on the use of PPE | 100 | 4.623 | 0.763 | 0.138 |

| | | | | | |
|-----|--|-----|-------|-------|-------|
| 11. | Pre-employment health training and periodical medical examination should be performed. | 100 | 4.612 | 1.158 | 0.142 |
| 12. | Make provision for an effective training on health and safety for workers. | 100 | 4.567 | 1.010 | 0.136 |
| 13. | Make available all necessary protective devices | 100 | 4.550 | 1.138 | 0.126 |
| 14. | The use of PPE should be enforced at site. | 100 | 4.534 | 1.094 | 0.121 |
| 15. | Make available the necessary documentation on health and safety for workers. | 100 | 4.516 | 0.612 | 0.117 |
| 16. | Provide regular site safety instructions | 100 | 4.507 | 0.696 | 0.118 |
| 17. | An investigation should be carried out periodically on accidents and its causation. | 100 | 4.500 | 0.439 | 0.111 |
| 18. | Perform regular evaluation and monitoring of work safety performance | 100 | 4.498 | 0.490 | 0.109 |
| 19. | Provision of an incentive regime for contractors and workers who incorporate health and safety practices | 100 | 4.478 | 0.416 | 0.084 |
| 20. | Disseminate occupational health and safety information through print media/ television. | 100 | 4.430 | 0.542 | 0.099 |
| 21. | Government agencies should organize public lectures/ seminars on health and safety, | 100 | 4.427 | 0.573 | 0.068 |
| 22. | Periodically hold safety programmes and meetings at the workplace. | 100 | 4.423 | 0.736 | 0.078 |
| 23. | Publicize accidents and safety statistics nationwide. | 100 | 4.411 | 0.158 | 0.051 |
| 24. | Employees should be motivated to adopt good safety attitudes. | 100 | 4.401 | 0.010 | 0.030 |
| 25. | Encourage employees to attend and participate in the safety programs and meetings. | 100 | 4.389 | 0.183 | 0.062 |
| 26. | Financial support from government and financial institutions for the provision of health services. | 100 | 4.382 | 0.094 | 0.087 |
| 27. | Accidents that occur at the workplace should be reported to the appropriate agencies. | 100 | 4.379 | 0.621 | 0.091 |
| 28. | Ensure compliance with all safety standards at the workplace. | 100 | 4.367 | 0.669 | 0.104 |
| 29. | Provision of rehabilitation schemes for injured persons | 100 | 4.358 | 0.439 | 0.124 |
| 30. | Enforcement of Occupational Safety and Health policy by Trade Workers Union (TWU) | 100 | 4.327 | 0.049 | 0.128 |

| | | | | | |
|-----|--|-----|-------|-------|-------|
| 31. | Government should make it mandatory for players in the building industry to implement health and safety regulations. | 100 | 4.318 | 0.641 | 0.115 |
| 32. | Undertake an audit on safety hazards monthly. | 100 | 4.272 | 0.252 | 0.119 |
| 33. | Inspection of plants and machines should be carried out monthly. | 100 | 4.218 | 0.357 | 0.125 |
| 34. | Encourage employees and managers to have high expectations for work safety. | 100 | 4.200 | 0.673 | 0.134 |
| 35. | Ensure regular and proper maintenance of equipment and machinery. | 100 | 4.197 | 0.528 | 0.128 |
| 36. | Obsolete machines should be removed and new ones acquired to replace the old ones. | 100 | 4.189 | 0.901 | 0.097 |
| 37. | Maintain plant and equipment in a good shape to mitigate the likelihood of harmful emissions, and eliminate radiation hazards. | 100 | 4.010 | 0.638 | 0.162 |

Table 4.10- One Sample T- Test on measures to promote OHS

| ID | Measures | Test Value = 2 | | | | | |
|----|---|----------------|----|-----------------|-----------------|---|-------|
| | | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| 1. | Create an awareness on health and safety | 46.074 | 99 | .000 | 2.985 | 2.928 | 3.092 |
| 2. | Make provision for regular health services at the construction workplace | 45.899 | 99 | .000 | 2.976 | 2.917 | 3.068 |
| 3. | Adherence to regulations, legislation and standards of occupational health and safety | 42.767 | 99 | .000 | 2.964 | 2.911 | 3.007 |
| 4. | Make provision for personal protective equipment and enforce the utilization of them. | 36.237 | 99 | .000 | 2.951 | 2.906 | 2.985 |
| 5. | Undertake a safety risk assessment periodically | 35.090 | 99 | .000 | 2.932 | 2.892 | 2.975 |
| 6. | Establish a functional safety committee | 34.789 | 99 | .000 | 2.820 | 2.812 | 2.950 |
| 7. | Establish a health clinic at workplace. | 32.728 | 99 | .000 | 2.790 | 2.694 | 2.844 |
| 8. | Appoint a safety officer on a full time basis. | 30.675 | 99 | .000 | 2.701 | 2.675 | 2.815 |

| | | | | | | | |
|-----|--|--------|----|------|-------|-------|-------|
| 9. | Ensure the awareness of health and safety standards required by all regulations | 29.912 | 99 | .000 | 2.650 | 2.580 | 2.710 |
| 10. | In-house training on the use of PPE | 28.768 | 99 | .000 | 2.623 | 2.566 | 2.700 |
| 11. | Pre-employment health training and periodical medical examination should be performed. | 27.545 | 99 | .000 | 2.612 | 2.548 | 2.683 |
| 12. | Make provision for an effective training on health and safety for workers. | 25.745 | 99 | .000 | 2.567 | 2.460 | 2.610 |
| 13. | Make available all necessary protective devices | 24.872 | 99 | .000 | 2.550 | 2.454 | 2.605 |
| 14. | The use of PPE should be enforced at site. | 22.159 | 99 | .000 | 2.534 | 2.449 | 2.580 |
| 15. | Make available the necessary documentation on health and safety for workers. | 21.764 | 99 | .000 | 2.516 | 2.432 | 2.576 |
| 16. | Provide regular site safety instructions | 20.541 | 99 | .000 | 2.507 | 2.419 | 2.565 |
| 17. | An investigation should be carried out periodically on accidents and its causation. | 20.386 | 99 | .000 | 2.500 | 2.381 | 2.530 |
| 18. | Perform regular evaluation and monitoring of work safety performance | 20.236 | 99 | .000 | 2.498 | 2.379 | 2.524 |
| 19. | Provision of an incentive regime for contractors and workers who incorporate health and safety practices | 19.821 | 99 | .000 | 2.478 | 2.375 | 2.515 |
| 20. | Disseminate OHS information through print media/ television | 17.594 | 99 | .000 | 2.430 | 2.328 | 2.510 |
| 21. | Government agencies should organize public lectures/ seminars on health and safety, | 17.281 | 99 | .000 | 2.427 | 2.316 | 2.490 |
| 22. | Periodically hold safety programmes and meetings at the workplace. | 15.989 | 99 | .000 | 2.423 | 2.308 | 2.483 |

| | | | | | | | |
|-----|--|--------|----|------|-------|-------|-------|
| 23. | Publicize accidents and safety statistics nationwide. | 15.921 | 99 | .000 | 2.411 | 2.290 | 2.494 |
| 24. | Employees should be motivated to adopt good safety attitudes. | 15.910 | 99 | .000 | 2.401 | 2.275 | 2.455 |
| 25. | Encourage employees to attend and participate in the safety programs and meetings. | 14.797 | 99 | .000 | 2.389 | 2.249 | 2.447 |
| 26. | Financial support from government and financial institutions for the provision of health services. | 14.202 | 99 | .000 | 2.382 | 2.232 | 2.436 |
| 27. | Accidents that occur at the workplace should be reported to the appropriate agencies. | 13.747 | 99 | .000 | 2.379 | 2.289 | 2.424 |
| 28. | Ensure compliance with all safety standards at the workplace. | 12.969 | 99 | .000 | 2.367 | 2.275 | 2.415 |
| 29. | Provision of rehabilitation schemes for injured persons | 12.483 | 99 | .000 | 2.358 | 2.228 | 2.410 |
| 30. | Enforcement of Occupational Safety and Health policy by Trade Workers Union (TWU) | 12.462 | 99 | .000 | 2.327 | 2.216 | 2.390 |
| 31. | Government should make it mandatory for players in the building industry to implement health and safety regulations. | 12.352 | 99 | .000 | 2.318 | 2.208 | 2.383 |
| 32. | Undertake an audit on safety hazards monthly. | 11.551 | 99 | .000 | 2.272 | 2.190 | 2.294 |
| 33. | Inspection of plants and machines should be carried out monthly. | 10.815 | 99 | .000 | 2.218 | 2.175 | 2.255 |
| 34. | Encourage employees and managers to have high expectations for work safety. | 10.721 | 99 | .000 | 2.200 | 2.149 | 2.247 |
| 35. | Ensure regular and proper maintenance of equipment and machinery. | 10.033 | 99 | .000 | 2.197 | 2.132 | 2.236 |

| | | | | | | | |
|-----|--|-------|----|------|-------|-------|-------|
| 36. | Obsolete machines should be removed and new ones acquired to replace the old ones. | 9.623 | 99 | .000 | 2.189 | 2.099 | 2.227 |
| 37. | Maintain plant and equipment in a good shape to mitigate the likelihood of harmful emissions, and eliminate radiation hazards. | 9.501 | 99 | .000 | 2.010 | 2.003 | 2.198 |

The results in the Table above, indicates that all measures provided in the Table are significant for achieving safer working practices and promoting the health and wellbeing of construction workers.

The study revealed that the highest measure score (4.68 ± 0.469) was “Create an awareness on health and safety”, with obtained t- value 35.924, statistically significant difference of 2.800 (95% CI, 2.68 to 2.82), $t(99) = p = .000$. The most critical measures identified by the one sample t-test method were sure to provide a means to overcome the potential barriers inhibiting the incorporation of health and safety in the Ghanaian construction industry.

4.12 DISCUSSION OF FINDINGS

4.12.1 GENERAL ISSUES ON OCCUPATIONAL HEALTH AND SAFETY

The operations of the Construction industry are often associated with high levels of occupational hazards. The study sets out to assess the effectiveness of the occupational health and safety practices in the various construction firms under survey. The study revealed that, most of the companies had desk officers in charge of Occupational Health and Safety. It was observed however that, these desk officers had other responsibilities

apart from ensuring safety in the work place. The educational backgrounds of the desk safety officers were mainly GCE “O” and GCE “A”.

4.12.2 LEVEL OF AWARENESS ON HEALTH AND SAFETY

It is noted that in Ghana there is the non-existence of a national occupational safety and health policy, however the main sources of legislative regulations on

Occupational Safety and Health includes the Factories, Offices and Shops Act 1970 Act 328, Workmen’s compensation Law Act 187 Act 1987 and Labour Act 651 Act 2003. The study revealed that most construction firms were familiar with and implemented the Factories Offices and Shop Act 1970, Act 328.

4.12.2.1 OCCUPATIONAL HEALTH AND SAFETY PRACTICES

The study identified the practices that were common in most construction firms:

- Posting of safety signs and notices on health and safety at the workplace.
- Periodic inspection and maintenance of plants and machines
- Utilization and availability of personal protective clothing and equipment
- Provision of safety policies and booklets
- Provision of welfare facilities such as first aid services and referral.

Sawacha, et al. (1999), suggested that the five significant practices necessary to improve site health and safety includes: provision of safety pamphlets; providing safety equipment; management talk on safety; maintaining safety environment and employing trained safety personnel on site.

4.12.2.2 FAMILIARITY WITH PERSONAL PROTECTIVE DEVICES

International Labour Organization's Code of Practice on Health and Safety on Construction site (1999), postulate that employers are required to provide all workers with personal protective equipment and clothing at the construction site during work operations. The study revealed that most construction workers are familiar with Safety Boots, Helmet, Work Apron and Googles.

4.12.3 EXTENT OF IMPLEMENTATION OF OHS

It was indicated by the respondents that the occurrence of accidents is common with construction operations. This confirms the study conducted by International Labour Organization, (2008) that construction is one of the most dangerous industries as it works are associated with higher risks as to the health and safety of the construction workers, who are often subjected to fatalities and ill- health problems. The study revealed that workers who were victims of the workplace accidents were compensated for as required by National Labour Act 651, Act 2003.

Only few of the construction firms under survey had kept records of accidents that occurred. Most of the companies visited had insurance cover for their workers. It was revealed that these insurance did not cover all construction workers due to the transient nature of construction workforce. Migrant or transient workers do not receive full occupational health and safety benefits.

It was revealed in the study that most of the constructions firms do not report accidents that occur whether fatal or non-fatal to the appropriate agencies such as Department of Factories Inspectorate and Kumasi Metropolitan Labour Department. Workers who are injured as a result of the occupational accidents are easily replaced in most construction firms. This affirms the low commitment of management to the health and wellbeing of their workers.

A few of the construction firms surveyed had an occupational health and safety policy existence. However, the study revealed that these safety policies were not fully implemented in the various construction firms. It was suggested by most of the respondents that occupational safety and health policy should be a requirement for only large construction companies. This confirms the poor commitment of small construction firms in the implementation of occupational health and safety. Only few companies had established safety committees constituting of managers, supervisors or trade representatives. Membership of safety committees should consist of representative from each working department.

The study revealed that only few companies had made some effort to provide health and safety training for their workers. Adequate education and training on occupational health and safety should be provided to construction workers to help create their awareness on the subject and also help improve workers' productivity level. None of the construction firms surveyed had ever organized periodic medical screening nor pre-employment medical examination for their construction workers. Also, none of the firms had established a health clinic at their workplace. This confirms the perception that

construction managers pay little attention to the health and wellbeing of construction workers. However, most of the companies provided first aid services for workers who were injured or ill.

It was observed that only a few of the construction firms visited had health and safety visual signals, notices and signs on walls and vantage points. Most of the posters and newsletters on occupational health and safety were left in the drawers of managers. Personal protective equipment was the main measure adopted by most construction firms to reduce the effect of occupational safety hazards on the health of workers. However, it was revealed in the study that about 70% of all construction workplaces had insufficient or no Protective Personal Equipment.

It was indicated in the study that most construction companies do not enforce the use of these protective personal equipment on their workers. It was revealed by the survey that most of construction firms do not perform regular evaluation and monitoring of work safety performance. This confirms that most supervisors and managers are not aware of the required standards for work safety and employee health.

4.12.4 PERCEPTION ON THE BENEFITS OF OCCUPATIONAL HEALTH AND SAFETY

The survey revealed that respondents perceive the benefits of occupational health and safety as including:

- Likely reduction in the occurrence of injuries, illness or death at the jobsite

- Project delivered successfully on time and to cost
- Create awareness of dangerous work practices.

This confirms the study by Rudin (2005), which also identified likely reduction in the occurrence of injuries, illness, or death at the jobsite as a benefit of incorporating health and safety measures in construction organizations.

4.12.5 IMPLICATIONS OF NON-COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY

Construction projects are associated with a lot of work-related injuries. The common occupational disease identified by the survey were musculoskeletal / lower back pain, chronic headache, respiratory tract infection and hearing problems. The study identified severe injuries at the construction workplace as including fracture, contusions of fingers, hands and legs.

4.12.6 GENERAL BARRIERS ASSOCIATED WITH THE IMPLEMENTATION OF HEALTH AND SAFETY PRACTICES.

The possible barriers that were considered as significant have been listed below.

- Disorganized and transient workforce
- Temporary nature of construction project
- Unavailability and insufficient occupational health and safety policy

- Unwillingness to input resources in occupational health and safety
- Poor commitment of management to safety policies
- High cost of health and safety practices
- Reckless operations
- Poor attitudes of construction workers to safety practices • Low educational background of workers.

Other factors influencing health and safety as identified from literature sources include; control and prevention safety system, worker involvement, commitment of management and safety arrangement. Construction workers union should adopt and ensure OSH policy is included in their working agreement to ensure effective implementation of the policy. Construction workers should join trade labour unions and attend their meetings as such unions seek to protect and promote the health and wellbeing of workers and make available important information. Trade unions focus on seeking only reasonable remuneration for workers and pay little attention on occupational health and safety to improve the health of workers.

4.12.7 MEASURES FOR ACHIEVING SAFER WORKING PRACTICES AND IMPROVED HEALTH AND WELLBEING OF CONSTRUCTION WORKERS.

The study sort to identify measures needed to achieve a healthy and safety working environment for workers. These measures will also prevent accidents and reduce various health and safety menaces. Using one sample t-test method the critical measures needed to encourage the incorporation of occupational health and safety in construction firms were identified.

It was revealed that the other factors correlate closely with the major factors and proved to be essential for this study. This has been presented below.

1. Create an awareness for occupational health and safety

- Establish a functional safety committee.
- Make provision for an effective training on health and safety for workers.
- Provide regular site safety instructions
- Make available the necessary documentation on health and safety for workers.
- Publicize accidents and safety statistics.
- Employees should be motivated to adopt good safety attitudes. - Government agencies should organize public lectures/ seminars on occupational health and safety practices.
- Periodically hold safety programmes and meetings at the workplace - Encourage employees to attend and participate in the safety programs
- Disseminate safety information through print media/ television broadcast.

2. Make provision for regular health services at the construction workplace

- Appoint a health and safety officer on a full time basis.
- Perform Pre-employment health examination and periodical medical screening.
- Establish a clinic for the provision of constant health services at the workplace
- Financial support from government and institutions for health services
- Provision of rehabilitation schemes for injured persons
- Enforcement of Safety and Health policy by Trade Workers Union (TWU)

3. Ensure adherence to regulations and standards of occupational health and safety

- Ensure the awareness of health and safety standards
- Ensure compliance with all safety standards at the workplace.
- Accidents should be reported to the appropriate agencies.
- Government should make it mandatory for players in the building industry to implement health and safety regulations during the construction of buildings.

4. Make provision for personal protective equipment and enforce their utilization.

- In-house training on the use and benefit of protective equipment.
- Make available all necessary protective devices for workers.
- The use of PPE should be enforced at the worksite.

5. Undertake a risk assessment on health and safety periodically

- Perform regular evaluation and monitoring of work safety performance
- An audit on safety hazards should be carried out monthly.
- An investigation on accidents should be carried out periodically.
- Encourage employees and managers to have high expectations for work safety.

6. Equipment and machinery should be maintained effectively at all times

- Ensure regular and proper maintenance of equipment and machinery.
- Inspection on plants and machines should be carried out monthly.
- Obsolete machines should be removed and new ones should replace them,
- Maintain plant and equipment in a good shape to mitigate the likelihood of harmful emissions and eliminate radiation hazards.

It is stipulated in section 10 and 12 of the Factories, Offices and Shop Act 1970 Act 328 that accidents and health hazards that occur at the workplace should be reported to Department of Factories Inspectorate. However, the research conducted revealed that many of the companies visited do not report accidents and hazards that occur at site to the appropriate agencies. This is consistent with a study conducted by Boateng and Nimako (2000), which revealed that the inspections conducted by these agencies are restricted to only organizations that are associated with frequent accidents.

Government agencies such as the Department of Factories Inspectorate (DFI) and Kumasi Metropolitan Labour Department (KMLD) should be well resourced to cater for its staffing, financial and logistical problems to enable them enforce the occupational health and safety regulations such as the Factories, Offices and Shop Act 1970 Act 328 effectively in the construction industry. It was identified in the study that to promote the health and wellbeing of construction workers a law should also be formulated for the provision of rehabilitation centres for workers who are severely injured or incapacitated as a result of workplace accidents.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The study sets out to assess the factors that affect the acceptability of occupational health and safety in the Ghanaian construction industry. This study purposed to determine the perceived benefits and level of awareness of construction stakeholders and workers in the

various construction industries registered in the Kumasi Metropolis on the concept of occupational health and safety.

The survey revealed occupational health hazards are perceived to be normal with construction operations. Occupational health hazards and accidents occur as a result of poor attitudes and behaviour of individuals as well as improper work practices. This is evidently seen in the construction operations and management, even though construction is associated with dangerous health hazards. Injured workers are immediately replaced which appears to be an easy option for construction managers; the payment of insurance premium for accidents is perceived to be a sufficient cover for the workers and the construction companies.

Also most of the construction firms do not have their own clinics which could serve as a first point for treatment for injured or sick workers before subsequent referral to a well-resourced hospital like Komfo Anokye Teaching Hospital can be made on their behalf. This confirms the perception that little attention is paid on the health and wellbeing of construction workers.

The study revealed that the major barriers inhibiting the implementation of OHS include: disorganized and transient workforce, unwillingness of management to input resources in improving health and safety, little priority given to health and safety issues, unavailability of safety policies, poor commitment of management to the implementation of OHS and low level of education of workers.

There is a need to improve the knowledge of construction professionals and workers on occupational health and safety through safety training to enable them appreciate the concept and to increase their safety consciousness so as to become aware of the dangers associated with construction work and its environment. Safety instructions, warnings and general information on occupational health and safety should be provided at all times to aid the prevention of accidents at the workplace.

The study also identified the following practices as effective for promoting occupational health and safety: operating under a safety zone; existence of safety committee and full time occupational health and safety desk officer; provision of company clinic; formal training on occupational health and safety practices, availability of information, newsletters and posters on occupational health and safety; education and training on the use of personal protective equipment; availability of fire extinguisher and protection against chemical explosions and fire outbreak.

It can be concluded that the non- acceptability of occupational health and safety in the Ghanaian construction industry is due to behavioural issues of construction managers and workers such as negligence and carelessness.

5.2 RECOMMENDATIONS

5.2.1 General

A lot of recommendations have been made by researchers in promoting occupational health and safety in the Ghanaian Construction Industry; however these have not been implemented. All the recommendations raised have been left on the shelves of

research institutions. The Ghanaian construction industry is still facing many challenges in the management of occupational health and safety. The following are some of the recommendations being made at the end of the study to promote safer working practices and to achieve improved health and wellbeing of construction workers. For easy identification the recommendations have been put together under various groups such are; Construction Professionals and workers, Manufactures, Publicity, Role of Government, Education, and General Public.

5.2.2 Construction Professionals and workers

- It is identified that many construction companies did not enforce occupational health and safety. Construction professionals should play their part in promoting the concept of health and safety by advising their clients to input resources into health and safety practices when they present their briefs.
- Construction professionals should ensure the adherence of occupational health and safety regulations, legislation and standards at their workplace. Supervisors and managers should be trained based on the legislation and regulation of occupational health and safety.
- Construction stakeholders should formulate Occupational Health and Safety Policies which should be mainly geared towards the accomplishment of a goal to provide a healthy and safety working environment for workers; prevent accidents and reduce various health and safety menaces at the construction workplace.

- Construction professionals should ensure the establishment of a health clinic at the construction site mainly for the provision of regular health services such as administration of First aid, referral, keeping of health records, periodic medical examination, pre-employment medical screening, and sick leave. A full time health and safety officer should be employed and a safety committee formulated to ensure safer working practices and improved health and wellbeing of construction workers.
- Construction managers should make provision for personal protective equipment and enforce the utilization of them at the workplace. Researchers and professionals should be made available to provide adequate training and effective education on the use of personal protective equipment for workers. Architects, contractors and other construction professionals should create awareness on safety by recommending protective devices for their projects.
- Information on occupational safety and health should be disseminated through print media, posters, television and training programme.
- It is recommended that experts who promote the use of occupational health and safety and employees who incorporate health and safety practices and avoid workplace accidents be given incentives.
- Equipment and machinery should be maintained effectively at all times. Construction workers and supervisors should ensure that plants and machines are in good shape before operating them. Guidance on machine safety should

be made available for machines with vulnerable parts. Machine parts that are worn out should be replaced out rightly.

- Occupational Health and Safety performance should be monitored and evaluated and managers should determine whether OHS standards have being met.
- The environmental condition of the workplace should be monitored regularly. Recommendation and advice provided by Factories inspectorate, Environmental protective agencies and other regulatory agencies should be adhered to ensure work safety.
- Risk assessment must be performed at all times to ensure that the existing controls, training and safeguards are still performing at their desired functional level. The risk assessment should be undertaken to identify perils in the working area, work method adopted and workers safety condition Information obtained from risk assessment should be made available to employees as they are of relevance to ensuring work safety.

5.2.3 Manufacturers of personal protective equipment

- The manufacturers of personal protective equipment should form an association. As an association, it may be easier to obtain funds from government and other financial institutions. Also technology transfer between members of the association can be enhanced leading to efficiency and uniformity and quality in

the production of the protective personal devices. As an association, they can adopt an integrated marketing policy to increase their profit margin.

- Manufacturers should ensure that they produce quality protective devices as this will attract investors locally and international. Standards and specifications of the protective devices and clothing need to be established. Partnership with private investors can be encouraged to produce and supply protective equipment to ensure very regular supplies so as to encourage construction professionals to rely on and enforce the use of protective devices and clothing.
- Financial institutions must be made aware of the viability of occupational health and safety measures. This could be done through the printed and electronic media. This will encourage them to invest in the siting of more industries to produce personal protective equipment. With the introduction of more firms, there will be more of the protective devices available and possibly the cost of the protective devices will be low thereby allowing small construction companies to patronize these devices. Again employment will be created for most Ghanaians.

5.2.4 Publicity

- Special programmes should be established to create awareness of the general public on occupational health and safety which can be done through advertisement in the printed and electronic media/ television broadcast.

- It is recommended that research findings on the essential characteristics of occupational health and safety be made available to the populace through printed media and journals; this would create awareness of them and hence improve safety and health of construction workers.
- Promotion of occupational health and safety through awareness creation/ orientation workshops, seminars, public lectures especially in collaboration with district assemblies and dissemination of newsletters on OSH nationwide.
- Upgrade/ set up National Resource Training Center on occupational health and safety for trainers and end users. Document cost- effective improved technologies for the implementation of occupational health and safety.
- Furthermore, initiatives should be taken by co-operatives, non-governmental organizations (NGOs) and government agencies, to promote the awareness on occupational health and safety in order to popularize its implementation in all construction industry.

5.2.5. Role of Government

- There is the need for Government to legislate or promulgate an enforceable National Safety Policy to promote the operationalization of occupational health and safety at the national level. This policy should make occupational

health and safety a priority to tackle issues relating to occupational health hazards.

- Government agencies such as Department of Factories Inspectorate (DFI) and Kumasi Metropolitan Labour Department (KMLD) should periodically publicize both fatal and non-fatal accidents that have been reported to have occurred at construction industries this would improve safety consciousness of the populace.
- More resources should be channeled to occupational health agencies such as Department of Factories Inspectorate and Kumasi Metropolitan Labour Department to solve their understaffing and logistic problems.
- Government should take steps to safeguard the enforcement of occupational health and safety. The Department of Factories Inspectorate working in conjunction with the Kumasi Metropolitan Labour Department should evolve acceptable building regulations relating to occupational health and safety and ensure their compliance.
- There should also be an incentive regime for contractors who enforced safety policy in their projects. The government through some of its housing projects for example, mass housing schemes to alleviate poverty, should incorporate OSH Policy to serve as demonstrations to educate the populace. The

government should create a general enabling environment for the promotion of safety practices.

- Encouragement must be given to entrepreneurs who will want to venture into setting up industries for occupational health and safety in order to boost production capacities and improve their productivity. Machinery and equipment needed for setting up these factories should attract minimum duty and taxes.
- The government should support the establishment of health clinics at construction workplace, so that many construction firms can provide regular health services and also be able to employ full-time health practitioner such as a doctor and/ or nurse to aid in the promotion of the health and wellbeing of workers.
- In order to create the needed market and ensure sustainability of the protective personal devices and clothing, Government must make it a policy for all districts assemblies to show commitment in the adoption and enforcement of the use personal protective devices for all government projects.

5.2.6 Education

- The Ghanaian public, both in the rural and urban areas should be educated to accept the concept of occupational health and safety. Extra effort should be put in the education of people against the negative attitudes towards occupational health

and safety. One way of achieving this objective is to give assistance in the form of on the formal education and training on the benefit of incorporating health and safety to interested persons.

- To solve the problem of unskilled personnel, it is recommended that the technical and vocational institutes in the country should be adequately equipped to train skilled health and safety officer for the construction industry. Furthermore, on the job training of workers on the use of protective devices is also recommended.
- More researches can be carried out to ensure effective implementation of the health and safety concept.

5.2.7 General Public

- Ghanaians should do away with the negative attitudes and perception that occupational hazards and accidents are normal with construction operations in order to achieve long lasting development of safer working practices and improved wellbeing of workers.

Other important prerequisites for achieving the goals of occupational safety policy are; provision of suitable protective devices and technologies; assist in standardization and quality safety control; formulation of relevant health and safety regulations; dissemination of safety information to various user- groups, and manpower development and training to provide managerial and technical skills to cope with requirements of the occupational safety policy adopted.

Despite all the numerous factors inhibiting the use of occupational health and safety, the careful implementation of these recommendations and suggestions can solve a lot of the problems hindering the effective implementation of Occupational Safety and Health policy in the Ghanaian construction industry.

5.3 FUTURE RESEARCH

The following topics have been recommended for students, academicians and other interested researchers to conduct a study on them. These research areas will be very interesting and could make important conceptual contributions to the Ghanaian Construction Industry. The research topics include;

- Health and Wellbeing Performance of the Ghanaian Construction Industry. - Risk assessment on occupational health and safety in the Ghanaian construction industry.
- Factors affecting the health and wellbeing of Ghanaian Construction Workers.

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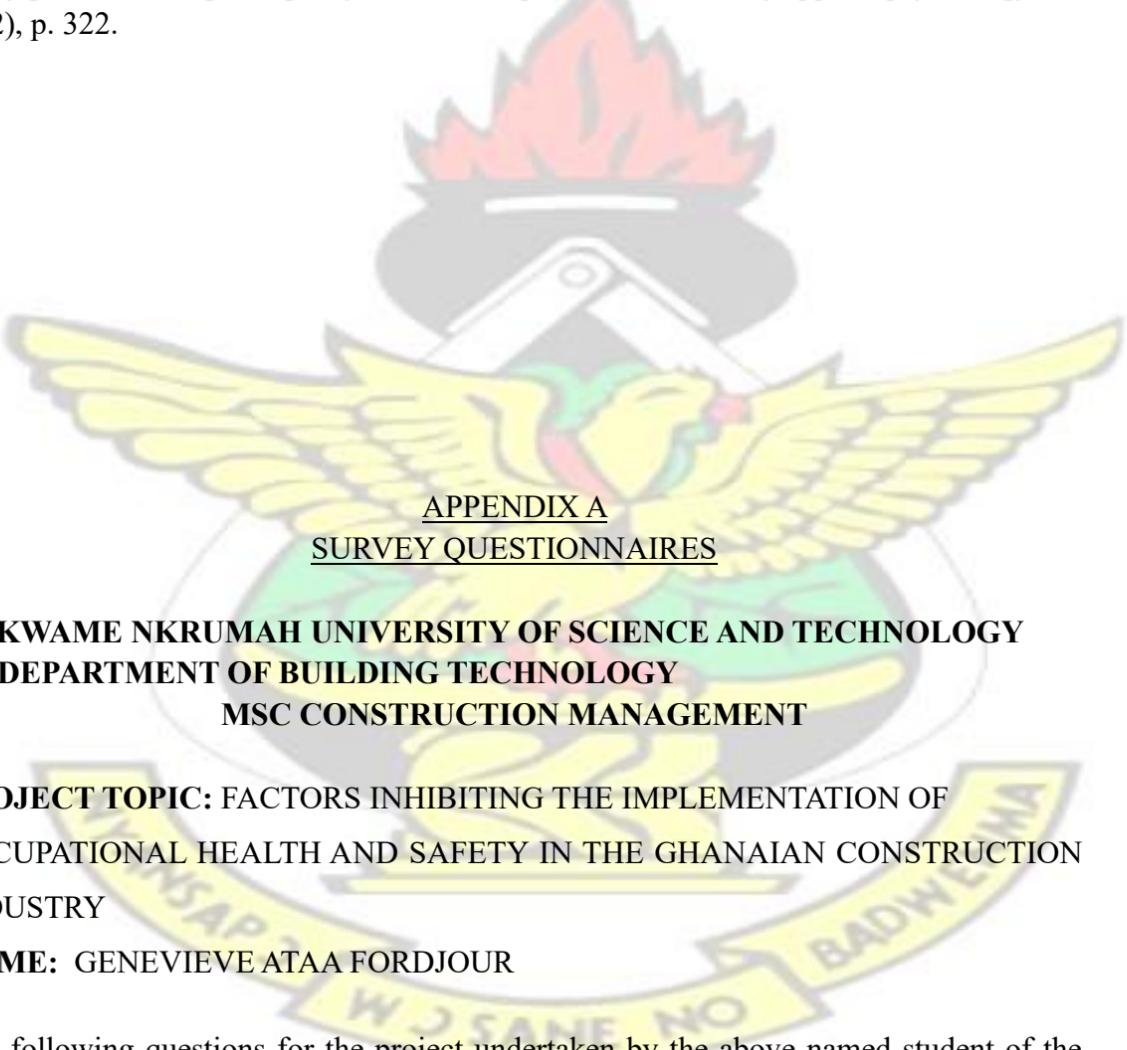
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APPENDIX A
SURVEY QUESTIONNAIRES

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF BUILDING TECHNOLOGY
MSC CONSTRUCTION MANAGEMENT

PROJECT TOPIC: FACTORS INHIBITING THE IMPLEMENTATION OF
OCCUPATIONAL HEALTH AND SAFETY IN THE GHANAIAN CONSTRUCTION
INDUSTRY

NAME: GENEVIEVE ATAA FORDJOUR

The following questions for the project undertaken by the above named student of the department of Building Technology are for academic purpose only. All questionnaires will be treated with the required privacy.

GENERAL INSTRUCTION; PLEASE TICK THE APPROPRIATE ANSWER SECTION
A: PERSONAL PROFILE

1. Which construction organization do you belong to?
a. D1K1 [] b. D2K2 [] c. D3K3 [] d. D4K4 []
2. Select which category you fall under?
a. Estate developer []
b. Architect []
c. Contractor []
d. Engineer []
e. Quantity Surveyor []
f. Consultant []
g. Others (Please Specify).....
3. How long have you been practicing?
a. Less than 1 year []
b. 1 - 5yrs []
c. 6 -10yrs []
d. Above 10yrs []

SECTION B: GENERAL QUESTIONS ON HEALTH AND SAFETY

4. Which of these personnel are responsible for safety and health in your Company?
a. Manager []
b. Supervisor []
c. OSH desk officer []
d. Medical doctor/ nurse []
5. What is the level of education of the health personnel?
a. GCE "O" []
b. GCE "A" []
c. JHS Level []
d. Secondary Level []
e. Polytechnic []
f. Graduate []
6. How frequent does accidents occur on site?
a. Sometimes [] b. Almost every day [] c. Not at all []
7. Are occupational hazards perceived to be normal with construction work?

- a. Yes [] b. No [] c. Not sure []
8. Are the victims compensated for these accidents?
- a. Yes [] b. No [] c. Not sure []
9. Does the company keep records of these accidents?
- a. Yes [] b. No [] c. Not sure []
10. Does the company have any insurance cover for these accidents?
- a. Yes [] b. No [] c. Not sure []
11. Does these insurance cover all construction workers?
- a. Yes [] b. No [] c. Not sure []
12. Can non- insurance policy holders make claim for injury benefits?
- a. Yes [] b. No [] c. Not sure []
13. Are these insurance premium expensive?
- a. Yes [] b. No [] c. Not sure []
14. Does your company provide full medical coverage for workers?
- a. Yes [] b. No [] c. Not sure []
15. Are accidents that occur at the workplace reported to the appropriate agencies?
- a. Yes [] b. No [] c. Not sure []
16. Does your company replace injured workers?
- a. Yes [] b. No [] c. Not sure []
17. Is there an existence of occupational health and safety policy in your company?
- a. Yes [] b. No [] c. Not sure []
18. Do you see health and safety policies being implemented in your organizations?
- a. Yes [] b. No [] c. Not sure []
19. Should occupational safety policy be a requirement for only large companies?
- a. Yes [] b. No [] c. Not sure []
20. Have your company employed a full-time health and safety officer?
- a. Yes [] b. No [] c. Not sure []
21. Have your company established a health and safety committee?
- a. Yes [] b. No [] c. Not sure []
22. Does your company organize health and safety training programs?
- a. Yes [] b. No [] c. Not sure []
23. Does the company organize periodic medical screening for employees?
- a. Yes [] b. No [] c. Not sure []

24. Does your company organize pre-employment medical examination?
a. Yes [] b. No [] c. Not sure []
25. Does your company have a clinic for the provision of health services?
a. Yes [] b. No [] c. Not sure []
26. Does your company provide first aid services for injured workers?
a. Yes [] b. No [] c. Not sure []
27. Does your company have visual signals, posters on health and safety?
a. Yes [] b. No [] c. Not sure []
28. Does your company enforce the utilization of protective devices?
a. Yes [] b. No [] c. Not sure []
29. Is there punishment for you when you go against the health and safety policies?
a. Yes [] b. No [] c. Not sure []
30. Does your company perform regular evaluation and monitoring of work safety performance?
a. Yes [] b. No [] c. Not sure []
31. Which of the following health problems are rampant at the workplace? Please indicate the level of frequency of the following health problems by ticking the appropriate number. Note: **1= Not Frequent 2= Less Frequent 3= Neutral 4= Frequent 5= Highly Frequent**

| ITEM | Occupational Injuries | 1 ST | 2 ND | 3 RD | 4 TH | 5 TH |
|------|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | Fracture | | | | | |
| 2. | Contusions of fingers | | | | | |
| 3. | Contusions of hands | | | | | |
| 4. | Contusions of legs | | | | | |
| 5. | Minor cuts | | | | | |
| 6. | Others (specify)..... | | | | | |

SECTION C: LEVEL OF AWARENESS ON HEALTH AND SAFETY.

32. Which of these health and safety regulation are operational in your company?
Please indicate the level of utilization by ticking the appropriate number. **Note: 1= Not Utilized 2= Less Utilized 3= Neither 4= Utilized 5= Highly Utilized**

| ITEM | HEALTH AND SAFETY REGULATIONS | 1 ST | 2 ND | 3 RD | 4 TH | 5 TH |
|------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | Factories Offices and Shop Act 328 | | | | | |
| 2. | Workmen's compensation Law Act 187 | | | | | |
| 3. | Labour Act 651, Act 2003 | | | | | |
| 4. | Building Regulations | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 5 | Code of Practice on Health and Safety in Construction Sites, ILO 1992 | | | | | |
| 4. | Others please specify | | | | | |

33. Please indicate the level of incorporation of the following practices in your firm by ticking the appropriate number. **Note: 1= Not Practiced 2= Less practiced 3= Neither 4= Practiced 5= Highly Practiced**

| ITEM | HEALTH AND SAFETY PRACTICES | 1ST | 2ND | 3RD | 4TH | 5TH |
|------|---|-----|-----|-----|-----|-----|
| 1. | Formal training on occupational health and safety practices | | | | | |
| 2. | Posting of safety signs, notices and availability of newsletters on health and safety | | | | | |
| 3. | On the job training and education on the use of personal protective equipment. | | | | | |
| 4. | Full time employment of occupational health and safety desk officer at the site | | | | | |
| 5. | Utilization and availability of personal protective clothing and equipment | | | | | |
| 6. | Provision of welfare facilities such as first aid services and referral. | | | | | |
| 7. | Compliance with all safety standards at the workplace | | | | | |
| 8.. | Reporting any contravention of the safety policies to authorities | | | | | |
| 9. | Inspection and regular meeting on work safety | | | | | |
| 10. | Periodic risk assessment on occupational safety and health | | | | | |
| 11. | Provision of safety policies and booklets | | | | | |
| 12. | Operating under safety zone | | | | | |
| 13. | Regular monitoring of the environmental condition of the workplace | | | | | |
| 14. | Periodic inspection and maintenance of plants and machines | | | | | |
| 15. | Replacement and repair of obsolete and broken machines | | | | | |
| 16. | Others (specify)..... | | | | | |

34. Please indicate the level of utilization of the following protective devices by ticking the appropriate number. **Note: 1= Not Utilized 2= Less Utilized 3= Neither 4= Utilized 5= Highly Utilized**

| ITEM | PROTECTIVE DEVICES | 1 ST | 2 ND | 3 RD | 4 TH | 5 TH |
|------|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | Helmet | | | | | |
| 2. | Goggles | | | | | |
| 3. | Face shield | | | | | |
| 4. | Apron | | | | | |
| 5. | Safety Boots | | | | | |
| 6. | Waterproof clothing | | | | | |
| 7. | Gloves | | | | | |
| 8. | Tight-fitting boiler suits | | | | | |
| 9. | Barrier creams | | | | | |
| 10. | Breathing gadgets | | | | | |
| 11. | Ear protectors | | | | | |
| 12. | Others (specify)..... | | | | | |

SECTION D: PERCEPTION ON THE BENEFITS OF HEALTH AND SAFETY.

35. Please indicate the level of agreement of the following variables by the ticking the appropriate number. **Note: 1= Highly Disagree 2= Disagree 3= Neutral 4= Agree 5= Highly Agree**

| ITEM | BENEFITS OF OCCUPATIONAL HEALTH AND SAFETY | 1 ST | 2 ND | 3 RD | 4 TH | 5 TH |
|------|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | Likely reduction in the occurrence of injuries, illness, or death at the jobsite | | | | | |
| 2. | Create awareness of dangerous work practices | | | | | |
| 3. | Promote sound and cordial working environment | | | | | |
| 4. | Increase the morale and work quality of employees | | | | | |
| 5. | Enhance effective communication at the construction site. | | | | | |
| 6. | Mitigate cost involve with recruiting new workers to replace injured workers | | | | | |

| | | | | | | |
|-----|--|--|--|--|--|--|
| 7. | Avoid uninsured medical costs to the company | | | | | |
| 8. | Eliminate overtime work | | | | | |
| 9. | Project delivered successfully on time and to cost | | | | | |
| 10. | Others (specify)..... | | | | | |

SECTION E: GENERAL BARRIERS ASSOCIATED WITH THE IMPLEMENTATION OF HEALTH AND SAFETY PRACTICES

36. I would be very grateful if you could indicate the level of influence of the following variables by ticking the appropriate number. **Note: 1= Not very influential 2= Not influential, 3= Neutral, 4= Influential 5= Very influential**

| ITEM | FACTORS | 1 st | 2 nd | 3 rd | 4 th | 5 th |
|------|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | High cost of health and safety practices | | | | | |
| 2. | Limited access to health and safety promotion programs. | | | | | |
| 3. | Poor commitment of management to safety policies | | | | | |
| 4. | Unavailability of safety tools and equipment | | | | | |
| 5. | Lack of knowledge on safety policies and practices | | | | | |
| 6. | Poor attitudes and behavior of individuals regarding occupational safety and health | | | | | |
| 7. | Low educational background of workers | | | | | |
| 8. | Inadequate health and safety training | | | | | |
| 9. | Disorganized and transient workforce | | | | | |
| 10. | Temporary nature of the work | | | | | |
| 11. | Type and method of construction practices adopted | | | | | |
| 12. | Reckless operations | | | | | |
| 13. | Unwillingness to input resources to safety | | | | | |
| 14. | Psychological, human and historical factors | | | | | |
| 15. | Others (specify) | | | | | |

SECTION F: MEASURES TO MITIGATE THESE BARRIERS

37. What do you think can be done to promote the use of health and safety practices extensively? Please indicate the level of agreement of the following variables by the ticking the appropriate number. **Note: 1= Highly Insignificant 2=**

Insignificant 3= Neither 4= Significant 5= Highly significant

| ITEM | MEASURES | 1ST | 2ND | 3RD | 4TH | 5TH |
|------|--|-----|-----|-----|-----|-----|
| 1. | Make provision for personal protective equipment and enforce their utilization. | | | | | |
| 2. | Undertake a risk assessment on health and safety periodically | | | | | |
| 3. | Government should make it mandatory for players in the building industry to implement health and safety regulations. | | | | | |
| 4. | Adherence to regulations, legislation and standards of occupational health and safety | | | | | |
| 5. | Provision of an incentive regime for those who incorporate health and safety practices | | | | | |
| 6. | Make provision for regular health services at the construction workplace | | | | | |
| 7. | Establish a clinic for the provision of constant health services at the workplace | | | | | |
| 8. | Make available all necessary protective devices for workers. | | | | | |
| 9. | Financial support from government and financial institutions for health services. | | | | | |
| 10. | Create an awareness on health and safety | | | | | |
| 11. | Government agencies should organize public lectures/ seminars on occupational health and safety practices. | | | | | |
| 12. | The use of PPE should be enforced on both workers and supervisors at the worksite. | | | | | |
| 13. | Report accidents to appropriate agencies. | | | | | |
| 14. | Disseminate health and safety information through print media/ television broadcast. | | | | | |
| 15. | Make available the necessary documentation on health and safety. | | | | | |
| 16. | Provide regular site safety instructions | | | | | |
| 17. | An investigation should be carried out periodically on accidents and its causation. | | | | | |
| 18. | In-house training should be organized on the use and benefit of protective equipment. | | | | | |
| 19. | Ensure compliance with all safety standards | | | | | |
| 20. | Establish a functional safety committee | | | | | |

| | | | | | | |
|-----|--|--|--|--|--|--|
| 21. | Publicize accidents and safety statistics | | | | | |
| 22. | Perform regular evaluation and monitoring of work safety performance | | | | | |
| 23. | Enforcement of Safety and Health policy by Trade Workers Union (TWU) | | | | | |
| 24. | Undertake an audit on safety hazards | | | | | |
| 25. | Provision of rehabilitation schemes | | | | | |
| 26. | Inspection of plants and machines should be carried out monthly. | | | | | |
| 27. | Encourage employees and managers to have high expectations for work safety | | | | | |
| 28. | Perform Pre-employment health training and periodical medical examination. | | | | | |
| 29. | Ensure the awareness of health and safety standards required by regulatory agencies. | | | | | |
| 30. | Appoint a health and safety officer | | | | | |
| 31. | Make provision for an effective training on health and safety for workers. | | | | | |
| 32. | Periodically hold safety programmes and meetings at the workplace. | | | | | |
| 33. | Obsolete machines should be removed and new ones acquired to replace the old ones. | | | | | |
| 34. | Encourage employees to attend and participate in the safety programs. | | | | | |
| 35. | Ensure regular maintenance of equipment | | | | | |
| 36. | Employees should be motivated to adopt good safety attitudes. | | | | | |
| 37. | Maintain plant and equipment | | | | | |
| 38. | Others (please specify)..... | | | | | |

THANK YOU FOR YOUR TIME AND COOPERATION.....